



NEW HOUSING NEW YORK LEGACY PROJECT

REQUEST FOR PROPOSALS

Issue Date: June 12, 2006



THE CITY OF NEW YORK
DEPARTMENT OF HOUSING PRESERVATION AND DEVELOPMENT

Michael R. Bloomberg, *Mayor*

Daniel L. Doctoroff
Deputy Mayor for Economic Redevelopment and Rebuilding

Shaun Donovan, *Commissioner*

The New Housing Marketplace

CREATING HOUSING FOR THE NEXT GENERATION



AIA New York Chapter



CONTENTS	PAGES
1.0 INTRODUCTION	4-5
1.1 Submission Process	
1.2 Sponsoring Organizations	
1.3 Additional Copies of RFP	
1.4 Contact for Questions	
1.5 Informational Sessions	
2.0 DEFINITIONS	8-9
3.0 PROJECT SNAPSHOT	10
4.0 SITE DESCRIPTION	11-12
4.1 Overview of Site	
4.2 Neighborhood Context	
4.3 Demographics	
5.0 PROJECT PROGRAM AND DESIGN GUIDELINES	13-17
5.1 Program	
5.2 Design Guidelines	
6.0 PROJECT FINANCING	18
7.0 STEP 1: OPEN REQUEST FOR QUALIFICATIONS	19-21
7.1 Submission Process	
7.2 Submission Requirements	
7.3 Selection Criteria	
8.0 STEP 2: FINALIST TEAM PROPOSALS	22-26
8.1 Submission Process	
8.2 Submission Requirements	
8.3 Selection Criteria	
9.0 PROJECT REQUIREMENTS AND GUIDELINES	27-30
9.1 Land Use and Environmental Approvals	
9.2 Obligations of the Selected Development Team	
9.3 Disposition	
9.4 Disposition Price	
9.5 Resale, Refinancing, and Recapture Restrictions	
9.6 Financing	
9.7 Property Use	
9.8 Equal Opportunity	
10.0 CONDITIONS, TERMS AND LIMITATIONS	31-33
11.0 CONFLICTS OF INTEREST	34

CONTENTS	PAGES
APPENDICES	35-77
I. Site Maps	
II. NHNY Steering Committee	
III. Design Guidelines	
IV. Financing Options	
V. Financing Term Sheets	
VI. HPD Marketing Guidelines	
VII. EO Requirements	
VIII. Additional Resources	
 EXHIBITS: Response Forms	 78-150
Tab A: Step 1 Response Completeness Checklist	
Tab B: Respondent Entity Information & Structure	
Tab C: Respondent Entity Principal Questionnaire	
Tab D: Respondent’s Letter of Interest	
Tab E: Respondent’s Letter of Understanding	
Tab F: Development Experience	
Tab G: Design Portfolio	
Tab H: Step 2 Response Completeness Checklist	
Tab I: Project Narrative & Design Documents	
1. Site Design and Planning	
2. Design / Architectural Documents	
Tab J: Sustainability Narrative	
1. LEED Checklist	
2. NYSERDA Multifamily High-Rise Energy Star Simulation Guidelines	
Tab K: Project Financing	
1. Condo / Co-op Project Income and Affordability	
2. Purchase Price and Affordability Calculations	
3. Rental Project Income and Affordability	
4. Rent and Affordability Calculations	
5. Construction Period Uses of Funds	
6. Construction Financing Sources	
7. Permanent Financing Sources	
8. Condo / Co-op Pro Forma Income and Expense Schedule	
9. Rental Pro Forma Income and Expense Schedule	
Tab L: Assets Statement	
Tab M: Project Development Schedule	

1.0 INTRODUCTION

The New York City Department of Housing Preservation and Development (“HPD”), working with the New Housing New York (“NHNY”) Steering Committee, is soliciting qualifications from architect-developer teams (“Respondents”) for the NHNY Legacy Project (“Legacy Project”), a mixed-use, mixed-income project on a City-owned site in the South Bronx (the “Site”). The Legacy Project emerges from a collaboration between the NHNY Steering Committee (see Appendix II), HPD and the American Institute of Architects, New York Chapter (AIANY) to develop a project that will raise the bar for design excellence and innovation in affordable housing in New York City and beyond.

This Request for Proposals (RFP) is organized as a two-step, juried design competition: in Step 1, Respondents are asked to submit qualifications, and in Step 2, up to five teams selected from Step 1 (“Finalist Teams”) will submit full development proposals (“Proposals”). HPD will enter into negotiations with the Finalist Team chosen by the jury in Step 2 to work toward disposition of the Site through the Uniform Land Use Review Procedure (ULURP). A Technical Review Committee appointed by the NHNY Steering Committee and HPD will review drawings throughout the development process to ensure compliance with the design intent of the winning proposal.

The Legacy Project builds upon the 2004 NHNY Design Ideas Competition, jointly sponsored by the City of New York, the New York City Council, AIANY, and the City University of New York.¹ Following up on the enthusiasm generated through that competition, the Legacy Project aims to explore new forms of affordable housing design for a 40,000 SF site in the Bronxchester Urban Renewal Area (URA) in the South Bronx. The Site also includes 20,000 SF of air rights over an adjacent abandoned railroad line that is privately owned. Proposals should integrate the programmatic elements and design guidelines outlined in Section 5.0.

Respondents are responsible for assembling an architect-developer team to undertake the design, construction and marketing of the Legacy Project, and for obtaining or providing all necessary construction financing. City, State, and/or Federal housing subsidies may be available. Appendices IV and V provide more information on financing sources and terms.

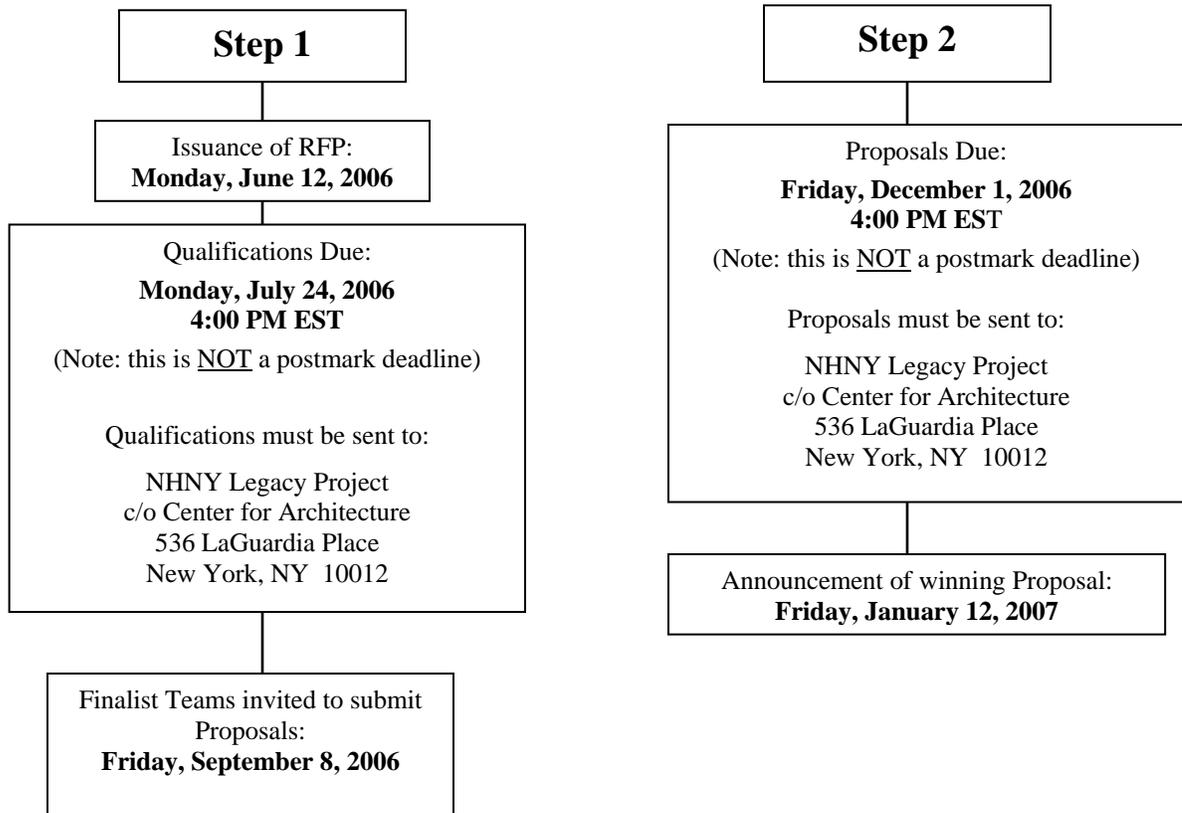
¹ Refer to the NHNY website at http://www.aiany.org/NHNY/NHNY_2004.html for more information on the Design Ideas Competition.

Preference will be given to proposals that:

- Set a high standard for **innovative design** in affordable housing, promoting design excellence and sensitivity to the needs and priorities of community residents, including an emphasis on health and healthy living.
- Demonstrate the ability to achieve long-term **environmental and economic sustainability** and savings through life cycle costing, which benefit owners, occupants, and the community with minimal incremental up-front costs.
- Propose **replicable financing** and ownership structures that leverage private investment and public subsidies towards **long-term affordability**.
- Promote successful ongoing **partnerships** between private enterprise and public agencies in the revitalization of urban neighborhoods.

Acceptance of this document should not be construed as a contract, nor shall it indicate any commitment on the part of New Housing New York or its sponsoring organizations for any future action.

1.1 Submission Process



1.2 Sponsoring Organizations (list in formation)

- NYC Department of Housing Preservation and Development
- American Institute of Architects, New York Chapter
- New York State Energy Research and Development Authority (NYSERDA)
- Enterprise Community Partners
- The City University of New York
- JPMorganChase Community Development Corporation

1.3 Additional Copies of RFP

This document is available to download from the HPD and NHNY websites at the following addresses:

- <http://www.nyc.gov/html/hpd/html/developers/rfp.shtml>
- <http://www.aiany.org/NHNY/>

Hard copies of the RFP are also available for purchase via mail or in person from 9 AM-5 PM at the Center for Architecture at 536 LaGuardia Place, New York, NY 10012. A seventy-five dollar (\$75.00) non-refundable fee in the form of a certified check or money order payable to the New York City Department of Finance must be presented to receive a hard copy of the RFP.

1.4 Contact for Questions

All questions about the Legacy Project must be put in writing to:

Karen Hu
Project Manager
HPD Office of Development
100 Gold Street, Room 9-G
New York, NY 10038

Fax: (212) 863-6386
Email: huka@hpd.nyc.gov

1.5 Informational Sessions

June 19 Kick-Off Event

A kick-off event to introduce the design competition will be hosted at the Center for Architecture at 536 LaGuardia Place on Monday, June 19, 2006 from 6:00-8:00 PM. Developers and architects seeking to form Respondent Teams are encouraged to attend.

June 27 Pre-Submission Conference and Financing Workshop

The NHNY Steering Committee will hold a pre-submission question/answer session on Tuesday, June 27, 2006 from 10:30 AM-12:00 PM and an optional financing workshop from 1:30 PM-4:00 PM at the Center for Architecture at 536 LaGuardia Place.

Additional questions and inquires regarding the RFP must be sent in writing by Friday, July 14, 2006 to Karen Hu at huka@hpd.nyc.gov. Responses to questions will be posted on the NHNY and HPD websites and distributed via email after the pre-submission conference. Unless requested and approved by the NHNY Steering Committee, no additional information submitted by Respondents after the Monday, July 24, 2006 Qualifications Due Date will be considered.

2.0 DEFINITIONS

Development Site or Site

The parcel and air rights being offered for development under this RFP, as shown in Appendix I.

Development Team or Developer

The Finalist Team selected by the NHNY Jury in Step 2 of the competition to commence negotiations with HPD regarding the development of the Site. The Development Team will provide equity, secure financing, design, develop, build, market, and manage the Project.

Finalist Team

The Respondent and the professional, technical, and construction entities (e.g. architect, engineer, general contractor, legal counsel, marketing, and managing agents) invited to participate in Step 2 of this RFP by submitting a full Proposal.

Jury or NHNY Jury

Experts in housing, architecture, development, green building, and related fields who have been invited by the NHNY Steering Committee to select up to five Finalist Teams in Step 1 and the winning Development Team in Step 2 of the Legacy Project design competition.

Legacy Project or Project

The development of housing, commercial/retail space, accessory residential parking, and other uses permitted on the Development Site.

Principal

An individual, partnership, limited liability company, corporation, or other not-for-profit or for-profit entity that will act as the general partner, officer or managing member of the Respondent, or any entity, limited partner, or other member that has at least a 10% ownership interest in the Respondent.

Proposal

Any and all materials submitted by a Finalist Team in response to Step 2 of the RFP, which constitutes a complete submission as described in Section 8.0.

Respondent or Respondent Team

An individual, partnership, limited liability company, corporation, joint venture, or other entity that submits qualifications in response to Step 1 of the RFP.

Subordinated City Debt

The amount equal to the sum of:

- 1) the difference between the cash portion of the purchase price paid at closing and the appraised value of the land; plus

- 2) the amount of any City construction subsidy for the construction of the units or homes (less the amount required to be repaid from proceeds from the sale of the units or homes, for homeownership projects).

Technical Review Committee

A subcommittee of the NHNY Steering Committee that will review the Development Team's design documents at designated intervals in the design process to ensure consistency with the winning design concept.

Uniform Land Use Review Procedure or ULURP

The process required under the City Charter for the public review of certain types of land use decisions, including but not limited to disposition of City-owned land, rezoning actions, Urban Renewal Plan amendments, and changes to the City map.

3.0 PROJECT SNAPSHOT

Site Location	Bronxchester Urban Renewal Area Primary Site: Site 1A (Block 2359, p/o Lot 3) Air Rights Site: Site 13 (Block 2359, p/o Lot 9001)
Square Footage	40,000 SF footprint, plus 20,000 SF of air rights over privately-owned abandoned railroad track adjacent to the primary site
Zoning	Current zoning: M1-1 Site must be rezoned; recommended rezoning is C4-4 (R-7 equivalent, which permits an FAR of 3.44 for residential uses). HPD will undertake rezoning as part of the disposition process to the selected Development Team.
Acquisition Price	Nominal price of \$1
Type of Development	Mixed-Use: Ground floor commercial/community space with residential above
Affordability	A minimum of 20% of units must be affordable to households earning up to 80% of the Area Median Income (AMI), as adjusted for household size. Proposals that provide the greatest affordability using the least amount of subsidy will be given preference. Total cash subsidy from HPD and HDC must not exceed \$85,000 per residential unit.
Land Use	The Site will require approval for disposition and rezoning through ULURP.
Environmental Approvals	HPD received a \$145,000 Brownfield Assessment Grant from the New York State Department of Environmental Conservation (DEC), to determine the extent and need for remediation on the NHNY Site. A survey of the Site and a Phase II EAS, which will give an estimate of the clean-up costs, will be available in mid-2006. The Development Team will be responsible for any remediation costs.

4.0 SITE DESCRIPTION

4.1 Overview of Site

The Site is composed of Bronxchester Urban Renewal Area Site 1A and Site 13. Site 1A is a vacant City-owned lot located just northeast of “the Hub”, the Bronx’s third largest shopping district. Site 1A is approximately 40,000 SF, and is located on the southeast corner of Brook Avenue and East 156th Street. Site 13 consists of City-owned air rights totaling approximately 20,000 SF over an adjacent privately-owned railroad track.

The railroad track itself, a 40.5-foot-wide strip of land that extends the length of the Site, is not owned by the City and is not part of the Site. However, Site 13 comprises the air rights 22 feet 6 inches above the railroad track, which are City-owned, making decking or cantilevering an option that is encouraged.

The winning Development Team may consider privately acquiring the tracks to supplement the Site. HPD is in contact with the owner of the railroad track and will share any relevant information with the Finalist Teams.

4.2 Neighborhood Context

The Site is northeast of “the Hub,” where Third, Melrose, Willis and Westchester Avenues and 149th Street intersect at Roberto Clemente Plaza. Once the commercial center of the Bronx, the Hub became plagued by urban decay in the 1950s. In an effort to encourage redevelopment, the City Planning Commission in 1968 designated this neighborhood as part of the original South Bronx Model Cities Urban Renewal Plan, and it is now within the Bronxchester Urban Renewal Area.

After decades of decline, the Hub has begun to experience a revival and is the Bronx’s third largest shopping district, with retail sales exceeded only by Fordham Road and Bay Plaza (2001 report from Bronx Borough President’s Office). East 149th Street, Melrose and 3rd Avenues are vibrant commercial thoroughfares. Rich transportation resources in the area include two subway lines, the Melrose Avenue Metro-North stop and seven bus routes. The Hub also enjoys excellent vehicular access from Manhattan via the Willis Avenue, 138th Street and 145th Street Bridges; from Long Island via the Triborough Bridge; and from points north via the Major Deegan Expressway.

Directly east of the Site is St. Mary’s Park, a 1,007-unit NYCHA development. South Bronx High School and its athletic field are southwest and south of the Site, respectively. Other uses in the nearby area include a Pet Boys auto-body shop and a juvenile detention center.

In an effort to combat the neighborhood’s severe decline, over \$2 billion of public and private money has been invested in housing and other redevelopment activity in the South Bronx since the 1980’s, mostly in the Melrose Commons and Yankee Stadium Urban Renewal Areas. In Melrose Commons, northwest of the NHNY Site,

hundreds of millions of public and private investment dollars have rejuvenated the community over the last decade. Hundreds of new housing units have been built already. When the Melrose Commons Urban Renewal Plan is completed, over 3,000 units of low- and moderate-income and market-rate apartments and townhouses will have been added to the housing stock.

The redevelopment of the Site will coincide with the revival of the Bronx Hub as a business center as well as a residential neighborhood. In late 2003, Mayor Bloomberg announced the Related Companies' planned development of Bronxchester URA Site 12 as a 160,000 SF mixed-use project that will house the Department of Finance offices, commercial spaces for national and local retailers, and a renovated municipal parking garage. The project is currently under construction.

In addition, the New York City Economic Development Corporation (NYCEDC) has designated Blackacre Capital Management LLC to develop Bronxchester Sites 6, 7A and 7B as "Plaza at the Hub", a mix of new Class A office space, big-box and local retail, entertainment, a multiplex movie theater and over 200,000 SF of new housing straddling East 150th Street and Westchester Avenue between Brook and Bergen Avenues.

A \$26 million capital reconstruction project was recently completed on East 149th Street at Melrose and Third Avenues. New York City Transit is about to begin the preservation and rehabilitation of the Historic Jackson Avenue station, which opened in 1904 and provides service for the No. 2 and No. 5 trains. The work scheduled for this station includes restoration of station houses, balconies, and stairs.

Verizon announced in August 2005 that Bronx customers can now have access to EV-DO, or evolution data-optimized technology, which allows download of documents, photos and video at speeds of 400-700 kilobits per second through the cellular network. The Bronx has been traditionally underserved by broadband access. The availability of this technology will help attract more businesses to the area and contribute to its continued economic development.

4.3 Demographics

Bronx Community District 1 (CD 1) is predominantly Hispanic (71%) and African-American (26%), with median household incomes at approximately \$21,870 for a family of four (or 31% AMI). A significant percentage of residents in CD 1 (94%) rents their apartments compared to the rest of the city (70%), presenting an opportunity to increase homeownership in the area. 35% of the residents in CD 1 are 18 years or younger, compared to the city average of 24.2%. According to the 2000 Census, the population in the district increased by 7.2% from 1990. Studies indicate that the population increase is continuing as immigrants and newcomers move into New York City. The rising cost of housing across the New York Metro area has affected the South Bronx and its residents. Residents in CD 1 live in more crowded living conditions than the city average.

5.0 PROJECT PROGRAM AND DESIGN GUIDELINES

5.1 Program

In response to the great need for affordable housing throughout New York City and the desire of all people to live in vibrant, healthy communities, the Legacy Project is intended to be a mixed-use, mixed-income development serving a diverse population of New Yorkers, with residential, commercial, community, and open space components. Proposals must offer efficient, sustainable, desirable housing that does not sacrifice quality for affordability, by integrating the following goals:

Affordable Living

The housing component should target families with mixed incomes through either homeownership opportunities (in the form of cooperative or condominium apartments) or rental housing. A minimum of 20% of the units must be affordable to families at or below 80% of the Area Median Income (“AMI”) as determined by the United States Department of Housing and Urban Development (HUD). Proposals that maximize affordability with the least amount of subsidy will be given preference. Proposals should target multiple income tiers.

Proposals should accommodate a range of family sizes and should strive to include 3-bedroom units. Proposals that dedicate a percentage of units for senior housing will be given preference. Designs should demonstrate an understanding of the evolving housing needs of New York’s population.

Sustainable Living

The Legacy Project challenges Respondents to integrate sustainable design and protection of the environment into every phase of the Project. From predevelopment through project completion, the potential impacts of everyday practices and activities on ecology, health, and quality of life should be minimized.

To this end, meeting or exceeding the Leadership in Energy and Environmental Design (LEED) Silver rating for the built portion of the project is required. Compliance with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines is also required. Please see Section 5.0 for complete Design Guidelines. Proposals that can achieve these goals with no or minimal initial capital costs and the greatest projected savings in long-term operating and maintenance costs will be given preference.

Healthy Living

The South Bronx has among the highest asthma rates in the country, and its residents suffer disproportionately from diabetes and obesity-related diseases. To this end, preference will be given to designs that promote healthy living.

The commercial/community facility component should support activities that enhance the health and well-being of the Project’s residents and the surrounding community.

Proposals should attempt to incorporate uses with a nutrition and/or fitness theme to promote a healthy neighborhood.

Building design and site planning should enhance the community by demonstrating a “healthy living” environment – creating clean and safe places for residents to live, work, learn, and play. This includes creating places that encourage human interaction and social gathering, and environments that nurture healthy, sustainable lifestyles, where individuals have the opportunity to engage in physical activities and exercise as part of their everyday routines. This may include, but is not limited to, outdoor recreation and communal space, accessible and safe staircases, and access to nutritional food and social services such as child-care and job training.

The open space component of the project should be designed with the residents’ needs in mind. Balancing active and passive recreational uses for all ages and populations, the design of the open spaces should enhance the livability and desirability of the Project.

Community Living

The NHNY Steering Committee is committed to engaging the South Bronx community in shaping the program for the Site. A preliminary public workshop was held on May 31, 2006, and a second workshop will be held after the Finalist Teams are selected. The Finalist Teams must attend the workshop, and their Proposals should reflect the results of this community outreach.

Top priorities, as articulated by participants at the May 31st workshop, are as follows (further details on the workshop are available at the NHNY website):

- On-site power production
- A minimum of 50% of the units affordable to low-income people in the community
- Affordable home ownership, diversity, civic pride and stability
- Quality and beneficial retail uses: healthy food store or supermarket, bookstore, etc.
- A showcase for sustainable design elements
- Building should blend in with neighborhood context, not a “new box”
- Recreation/community center space, daycare and programs for youth
- A beautiful and safe building and community
- Green space on interior and exterior
- Light and open space
- Generous room sizes with usable space to accommodate furniture comfortably; private dining room areas
- Windows in bathrooms and kitchens
- Laundry for residents in each unit or floor, not in basement, with exterior views

5.2 Design Guidelines

The following guidelines are REQUIRED of all Proposals. Please refer to Appendix III for additional design goals that are NOT mandatory and are included to guide the design process. If a modification to the guidelines would allow for a clearly superior and innovative design, suggested modifications must be accompanied by a clear and persuasive explanation of the proposed changes.

- 1) Proposals must meet or exceed the Leadership in Energy and Environmental Design (LEED) Silver rating (Exhibits Tab J).
- 2) Proposals must comply with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines (Exhibits Tab J).
- 3) Units proposed must meet the following HPD apartment planning requirements:

A. Unit Arrangement

1. There must be no circulation through bedrooms to other bedrooms or to primary bathrooms. Bathrooms should be near the bedrooms. Bathrooms must not open into the Living Room, Dining Room, or Kitchen. Circulation through the Living Room should be avoided.
2. All door placements and wall lengths should accommodate furniture placement.
3. Direct access to private outdoor space should be provided from a living space within the unit, not a bedroom.

B. Minimum Room Sizes

<u>Name of Space</u>	<u>0-BR</u>	<u>1-BR</u>	<u>2-BR</u>	<u>3-BR</u>	<u>4-BR</u>	<u>Least Dimension</u>
LR	NA	160	160	170	180	11'-0"
LR/DA	NA	210	210	230	250	11'-0"
LR/DA/SA	250	NA	NA	NA	NA	11'-0"
LR/DA/K	NA	270	270	300	330	11'-0"
LR/SA	210	NA	NA	NA	NA	11'-0"
K/DA	100	120	120	140	160	8'-0"
DR	NA	100	100	110	120	8'-0"
BR (primary)	NA	130	130	130	130	10'-0"
BR (secondary)	NA	NA	110	110	110	9'-4"

Abbreviations:

LR -Living Room

DR -Dining Room

K -Kitchen/Kitchenette

BR -Bedroom

SA -Sleeping Area
 0-BR-Apartment with no separate bedroom
 NA -Not applicable

Note: The room area shall be computed to the inside finished surfaces of the walls and partitions, and exclude columns, pipe chases, and closets.

Kitchenette / Kitchen

1. Kitchen to Living Room visibility should be maximized by pass-through openings, open counters, and half height partitions.
2. Plumbing and ventilation chase walls should be shared where possible, but not at the expense of the design.
3. Kitchen equipment must consist of a 30” range, refrigerator (14 c.f. min), 24” sink, base cabinets with countertop and wall hung cabinets. In 1 to 3 family homes, provision for dishwasher and hook-ups should be provided for the homeowner.
4. Countertop work surface should be located on both sides of the sink and both sides of the range.
5. The minimum length of countertop work surface (excluding sink and appliances) and cabinet shelving must be as follows:

<u>Apartment Type</u>	<u>Countertop Work Surface</u>	<u>Shelving</u>
0-BR	5 lin. Ft	30 lin. Ft.
1-BR	6 lin. Ft.	40 lin. Ft.
2-BR	7 lin. Ft.	50 lin. Ft.
3-BR	8 lin. Ft.	55 lin. Ft.
4-BR	8 lin. Ft.	65 lin. Ft.

6. Base cabinets and countertops must be 2’-0” deep. Shelving must be 11^{1/2}” deep.
7. Pantries are desirable, encouraged, and qualify as required shelving.

Dining Area

Every dwelling unit must contain a space for dining, which accommodates a table and chairs for the intended maximum number of occupants.

Bathrooms

1. Every dwelling unit must contain at least one full bathroom containing a bathtub with a showerhead, a sink, and a toilet. Compartmentalizing the bathroom, to enable simultaneous use by more than one person, is encouraged.
2. Three bedroom apartments must have an additional half bathroom containing a sink and a toilet, and possibly a shower.
3. Four bedroom apartments must contain two complete bathrooms.

Storage

1. Every dwelling must contain a coat closet that is convenient to the entrance and is at least 2'-0" deep and 3'-0" wide.
2. Every bedroom must contain a clothes closet that is at least 2'-0" deep and 5'-0" wide.
3. Every dwelling unit must contain storage for linens that is at least 1'-6" deep and 2'-0" wide.
4. Additional general storage space, such as a walk-in-closet, should be provided within each dwelling, especially for units with more than 2 bedrooms.

6.0 PROJECT FINANCING

It is the responsibility of the Development Team to obtain construction and permanent financing consistent with the Proposal. Total cash subsidy from HPD and HDC must not exceed \$85,000 per residential unit. See Appendices IV and V for a list of possible funding sources and for financing term sheets. Please note that financing programs and terms are subject to change.

A minimum of 20% of the units must be affordable to families at or below 80% of AMI. Proposals that maximize affordability with the least amount of subsidy, while targeting multiple income tiers, will be given preference. Proposals will be evaluated based on the efficiency and replicability of the financing plan. Innovative financing/ownership structures are encouraged.

7.0 STEP 1: OPEN REQUEST FOR QUALIFICATIONS

7.1 Submission Process

The Legacy Project Development Team will be selected through a two-step, juried process. Respondent Teams must include developers, architects, engineers, LEED-certified environmental consultants, and construction managers or general contractors. Respondents are encouraged to develop further creative collaborations. Established firms are encouraged to partner with emerging designers and developers.

Step 1 is an open request for qualifications. Based on an evaluation of the Step 1 submissions, the NHNY Jury will select up to five (5) Finalist Teams, who will be invited to go on to Step 2 and submit a full Proposal in response to the RFP. The Jury reserves the right to reject any or all qualifications received in response to this RFP. All work product prepared in response to this RFP becomes the property of New Housing New York. No submissions will be returned to Respondents. Finalist Teams invited to proceed to Step 2 will be notified by Friday, September 8, 2006.

Any questions regarding Step 1 of this RFP are to be directed to NHNY in writing no later than Friday, July 14, 2006. Questions must be submitted by email to Karen Hu at huka@hpd.nyc.gov. Responses to all questions will be available on the HPD and NHNY websites at <http://www.nyc.gov/html/hpd/html/developers/rfp.shtml> and <http://www.aiany.org/NHNY/>. Under no circumstance should any Respondent contact NHNY and/or any members of the Jury by phone, facsimile, personal visit, or any means other than the above e-mail address to request clarification of any elements of this RFP.

Step 1 submissions must be received no later than **4:00 p.m. on Monday, July 24, 2006**. Submissions must be sent by mail or delivered by hand (proposals submitted by facsimile and email will NOT be accepted) to:

NHNY Legacy Project
c/o Center for Architecture
536 LaGuardia Place
New York, NY 10012

7.2 Submission Requirements

Each Respondent shall submit one (1) reproducible original, and four (4) copies of their submission in 8-1/2" x 11" format (11"x17" pages may be folded). All proposals must be packaged in half-inch (1/2") three-ring binders. Responses must include the Step 1 Response Forms (See Exhibit Tabs A through G). The total Step 1 submission must not exceed 40 pages. The original and all copies must be clearly labeled, containing Respondent's return address and contact information; the face of the package should be labeled "**NHNY RFP Step 1.**"

All Respondents must submit the Step 1 Response Forms in the following order:

- 1) **Step 1 Response Completeness Checklist (Exhibits Tab A)**
- 2) **Respondent Entity Information and Team Structure (Exhibits Tab B)**

Identify the Respondent Team entities/members and describe the proposed team structure. Indicate the interrelationship between team members and a plan for working together through an integrated process. Include resumes for key personnel. At a minimum, the Respondent Team must include:

- DEVELOPER
- DESIGN TEAM
 - Design Architect
 - Housing Architectural Consultant and/or Architect of Record
(if different than Design Architect above)
 - Structural Engineer
 - Mechanical / Plumbing Engineer
 - LEED-Certified Environmental Consultant

Optional Design Team members could include:

*Landscape Architect
Electrical Engineer
Lighting Consultant*

- CONSTRUCTION MANAGER / GENERAL CONTRACTOR

- 3) **Respondent Entity Principal Questionnaire (Exhibits Tab C)**
- 4) **Respondent's Letter of Interest (Exhibits Tab D)**

Provide a general description of the Respondent Team, as well as a summary of the team's past experience as it relates to the vision for this Project. *No more than one page.*

- 5) **Respondent's Letter of Understanding (Exhibits Tab E)**

Each Step 1 Response must include this letter, signed by an authorized representative of the Respondent. Selection of a Development Team will mean only that HPD will commence negotiations with such Development Team regarding development of the Site. This letter sets forth certain information regarding the Project and procedures that form the basis of negotiations with HPD.

- 6) **Development Experience (Exhibits Tab F)**

Provide information on five (5) projects executed within the last ten (10) years, including one completed project of similar scale. The developer must have comparable experience in New York City. A detailed description of any innovative financing models used may be added. *No more than three pages.*

7) Design Portfolio (Exhibits Tab G)

Provide a portfolio of relevant projects executed within the last ten (10) years, including one completed project of similar scale. Projects must represent work by both the developer and architect, though not necessarily as collaborative efforts. For each project, include the following: (1) the name of the lead designer, (2) plans, elevations, sections and site plans for each project, (3) three dimensional exterior images or other drawings and photos, as desired; and (4) a brief written description highlighting the salient characteristics of the project, including the design and/or development philosophy and financing approach (if applicable) and a description of what was innovative about the design. List any design citations or awards, and entries to design competitions. Present each project on up to three (3) sheets, including all text. Format may be either landscape or portrait, but not both; sheets may be either 8.5x11 inches or 11x17 inches. *The portfolio must be no more than 15 pages total.*

7.3 Selection Criteria

The Jury will evaluate Respondents' submissions using the following criteria:

Demonstrated ability to respond to a range of complex design/development challenges with innovative solutions, executed with a high level of design and construction quality	Weight: 35%
Respondent Team composition and structure that presents the best complement of interrelated qualifications for the NHNY Project	Weight: 20%
Experience in developing affordable housing in comparably dense urban areas	Weight: 15%
Expertise in affordable housing development in New York City	Weight: 10%
Completed design/development projects that embody concepts and solutions that can be easily replicated, adapted or transferred to other locations	Weight: 10%
A record of successful completion of projects incorporating high-performance, environmentally-responsible systems and a range of sustainable design strategies	Weight: 5%
Experience in executing development projects on physically constrained and environmentally-compromised sites	Weight: 5%

8.0 STEP 2: FINALIST TEAM PROPOSALS

8.1 Submission Process

The NHNY Jury will select up to five (5) Finalist Teams from Step 1 who will be invited to submit a full design/development Proposal for the Legacy Project in Step 2 of this competition. Teams invited to participate in Step 2 will be notified by Friday, September 8, 2006. Each team will be paid a stipend of \$10,000 to develop their Proposal.

Step 2 Proposals must be received no later than **4:00 p.m. on Friday, December 1, 2006**. Submissions must be sent by mail or delivered by hand (proposals submitted by facsimile and email will NOT be accepted) to:

NHNY Legacy Project
c/o Center for Architecture
536 LaGuardia Place
New York, NY 10012

8.2 Submission Requirements

Each Finalist Team must submit one (1) reproducible original, and fourteen (14) copies of their Proposal, one (1) set of display boards, and two (2) CDs containing full size files of the presentation boards in PDF format, and individual image files in JPEG or TIFF format of all drawings submitted. Responses will include the Step 2 Response Forms (See Exhibits Tabs H-M). Proposals will be accepted sealed, containing the Finalist Team's return address and contact information; the face of the package should be labeled "**NHNY RFP Step 2.**"

All Finalist Teams must submit the Step 2 Response Forms in the following order:

- 1) **Step 2 Response Completeness Checklist (Exhibits Tab H)**
- 2) **Project Narrative & Design Documents (Exhibits Tab I)**

Site Design & Planning

Provide a written description of the Proposal, describing salient characteristics of the design from an urbanistic and architectural perspective, and the use of materials and systems for the proposed design. The narrative should convey the Finalist Team's vision, passion, and commitment to this Project. If creating designs that are in full compliance with the New York City Building Code and Zoning Resolution inhibits creative solutions, modifications to either may be submitted, accompanied by a description of the issue(s) that the Finalist Team wants to change, an explanation of why such modification is considered necessary or desirable, and how life safety will be maintained. *Narrative should be limited to two (2) pages.* The LEED checklist (See Exhibits Tab J) should be used to describe the green building features proposed. An additional description of how the Proposal complies with the

NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines can be included if deemed necessary.

Required Design/Architectural Documents

Drawings

All drawings must be formatted on 11" X 17" paper. The required drawings are intended to communicate both technical information and the design concept and an experiential sense of the finished scheme.

Plans

- Site Plan at 1 inch = 100 feet
- First Floor Plan showing commercial/ community space and residential lobby at 1/32" = 1'-0"
- Typical Building Floor Plan at 1/32" = 1'-0"
- Typical Unit Plans at 1/8" = 1'-0"
- Typical Unit Plans at 1/8" = 1'-0" showing furniture layouts

Elevations

- All four Street Elevations at 1/32" = 1'-0"

Sections

- One cross section at 1/32" = 1'-0"
- One longitudinal section at 1/32" = 1'-0"

Perspectives

- A minimum of two (2) perspective renderings demonstrating a pedestrian's view of the building. One view must show the primary residential entry (or entries if proposing separate buildings).

Display Boards

All Finalist Teams are required to submit their Proposals on up to two (2) 30-inch x 40-inch mounted boards with the 40-inch side oriented vertically (portrait format). Lightweight foam core board is preferred for mounting. The boards should have a maximum thickness of three-eighths of an inch (3/8"). The back and the front of the display boards must be free of any projections that might damage other entries when the boards are stored or transported.

The display boards must include a site plan, and any other drawings of the Finalist Team's choice that clearly demonstrate the proposed design concept.

3) Sustainability Narrative / LEED Checklist (Exhibits Tab J)

Please provide a written narrative to describe how this Proposal meets the sustainability requirements. *Narrative should be limited to two (2) pages.* Use the LEED checklist to itemize the proposed sustainability features. An additional description of how the Proposal complies with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines can be included if deemed necessary.

4) Project Financing (Exhibits Tab K)

- Describe the Finalist Team’s intended plan for funding both the debt and equity components of the Project, including sufficient information to document the Finalist Team’s financial capacity to support equity requirements (Exhibits Tab K, Forms K1-K9).
- Describe any adverse business conditions affecting the Finalist Team.
- Provide references from two (2) financial institutions.

5) Assets Statement (Exhibits Tab L)

Each Principal of the Finalist Team must submit audited or reviewed financial statements describing in detail the Principal’s financial status within the two (2) most recent fiscal years preceding the deadline for the submission of proposals in response to this RFP. Publicly-owned companies must submit the latest annual report and Form 10K as well as any Form 10Q submitted after such Form 10K. As an alternative, the Assets Statement in Exhibits Tab L may be used.

6) Project Development Schedule (Exhibits Tab M)

Please provide an estimated Project schedule for the completion of the NHNY Legacy Project. Note in the schedule the key dates for all aspects of work.

8.3 Selection Criteria

The Jury will evaluate Finalist Teams’ Proposals using the following criteria:

Innovative Design**Weight: 30%**

Proposals must demonstrate innovative ideas and concepts that address New York City’s needs by showing new ways to think about affordable urban living, the relation of public and private spheres in affordable housing, and how building design and amenities can promote healthy lifestyles among residents. If a modification to either the New York City Building Code or the Zoning Resolution would allow for a better solution, suggested modifications must be accompanied by a clear and persuasive explanation of the proposed changes.

The Jury will be looking for innovation in the following areas:

Form

- Building Massing: the overall building shape, size, volume, configuration
- Scale/Proportion: the building's relationship to neighborhood context and human proportions
- Spatial Definition/Image: the system and organization of space, structure and enclosure
- Articulation: the texture, surface, pattern, color, fenestration and detail of exterior enclosure and architectural elements

Program/Function

- Site Planning/Concept: building orientation and compatibility with site climate and geography; views; pedestrian/vehicular access; responsiveness to community priorities
- Open Space Development: active/passive uses; landscaping vegetation; circulation; parking
- Building/Dwelling Unit Layout: compliance with Design Guidelines and programmatic requirements
- Alternate DU Configurations / DU Distribution Mix: variation of DU layouts; proposed apartment distribution
- Universal Design Concepts: adaptability to all users regardless of age, ability or handicap
- Amenities: residential services; recreational, commercial, educational, social service facilities; promotion of health and healthy living

Technology

- Construction / Structural System: i.e. steel frame/ masonry bearing walls/ pre-cast concrete plank, etc.
- Exterior Enclosure: cmu with brick veneer/ curtain wall/ pre-cast panel, etc.
- Interior Partitions: gypsum wall board/cmu/ prefab panel, etc.
- Heating / Cooling / Ventilation: systems proposed
- Mechanical / Electrical / Plumbing: systems proposed
- Materials/Finishes: floor/wall/ceiling surfaces/fixtures

Green Building / LEED Rating

Weight: 20%

Green building technology has the potential to create better, more efficient and healthy solutions to construction practices and living conditions. The Jury will be looking for proposals that demonstrate:

- Inclusion of green building features
- Silver LEED Rating met/exceeded (See Exhibits Tab J)
- NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines met/exceeded (See Exhibits Tab J)

- Healthy Living concepts (See Section 5.1)

Economic Feasibility**Weight: 30%**

Proposals must demonstrate economic viability without sacrificing quality design. The Jury will be looking for buildings and infrastructure concepts that will adapt to new uses and last through time.

- Construction Costs: cost/SF and cost/DU
- Operating Costs (per month, per year)
- Financing Methods
- Financing Capacity
- Useful Life of Project (yrs)
- Preservation of Affordability: method for continuing affordability

Replicability**Weight: 10%**

Transferability of the proposed design should be demonstrated through:

- Construction Methodology: offsite/onsite construction; production requirements; labor force/level of skill required
- Construction Adaptability: extent construction is adaptable to different national climates/topography
- Building Layout: flexibility/adaptability of building layout to different locations
- Dwelling Unit Layout: flexibility/adaptability of DU layout to different users

Team Experience**Weight: 10%**

While this RFP seeks existing and new talent in the development and design fields, the Jury will be looking for a history of reputable projects, as well as demonstration of successful collaborations between architects and developers that show an integrated design process.

- Comparably-scaled projects and their relevance to Legacy Project goals
- Demonstrated ability by lead firm to manage a multi-party team

9.0 PROJECT REQUIREMENTS AND GUIDELINES

The selected Developer must comply with the NYC Department of Housing Preservation and Development's regulations and procedures.

9.1 Land Use and Environmental Approvals

The Project will require review and approval for disposition as City-owned property through New York City's Uniform Land Use Review Procedure (ULURP).

The selected Development Team will be expected to work with the City to prepare the necessary Environmental Reviews, pursuant to the City Environmental Quality Review (CEQR) requirements. The Development Team will be responsible for any remediation that may be required on the Development Site, including but not limited to the work detailed in the Phase II EAS that will be released in mid-2006. The Phase II will give an estimate of the clean-up costs and the scope of work, and will be made available to all Finalist Teams.

9.2 Obligations of the Selected Development Team

The Development Team will be required to perform the following:

1. Prepare a complete set of schematic site plans, floor plans, and elevations, and two renderings, and submit them to the Technical Review Committee appointed by HPD and the NHNY Steering Committee for review and approval within four (4) months of selection.
2. Prepare 30%, 60%, and 90% level construction documentation (drawings and specifications) for review by the Technical Review Committee for compliance with design intent of winning Proposal.
3. Prepare a complete set of final site plans, floor plans, and elevations, samples of exterior building materials and detailed specifications, and submit them to the Technical Review Committee for review and approval prior to disposition.
4. Assist HPD in the preparation of the ULURP application and participate in all required public forums, hearings, and briefings with the Community Board, elected officials, City agencies, and other organizations as may be required.
5. Fund and conduct any additional environmental review and/or soil testing and remediation required on the Development Site.
6. Provide an equity contribution and any guarantees as required by the construction lender, secure construction financing, and meet any other terms and conditions required by construction lenders.

7. Pay all transfer taxes associated with the conveyance of the Development Site to the Development Team. Pay all transfer and recording taxes associated with project financing, where applicable.
8. Market the housing units in accordance with City requirements and policy. (See Appendix VI for HPD Marketing Guidelines.)
9. Submit ongoing status reports regarding Project development, financing, marketing, leasing, and management.

9.3 Disposition

Disposition of the Development Site to the Development Team will be subject to: (1) the receipt of all public approvals required for the disposition of such Development Site and the development of the proposed Project on such Development Site, including without limitation, approval by the Mayor; and (2) the simultaneous closing of a bona fide construction loan for the full development of such Development Site. The Development Site will be conveyed in accordance with the terms of the Land Disposition Agreement (“LDA”) to be entered into between the Developer and HPD at the time of sale and will be conveyed in “as is” condition. Among other terms, conditions, and provisions, the LDA will contain covenants running with the land that require the Developer to develop the Development Site in accordance with the approval by the Mayor, plans and specifications approved by HPD and the applicable Urban Renewal Plans.

9.4 Disposition Price

Upon conveyance, the Development Team will pay the expected nominal cash price of \$1.00 and will deliver an enforcement note and mortgage in the amount equal to the sum of the difference between the cash portion of the purchase price paid at closing and the appraised value of the land.

9.5 Resale, Refinancing, and Recapture Restriction

The portion of the Subordinated City Debt attributable to the commercial component of the Project, if any, is repayable out of refinancing and resale profits and is non-evaporating.

Homeownership Projects

For any proposed ownership component, the Subordinated City Debt will be converted into an obligation on the purchasers who acquire the units or shares of the Project. The Subordinated City Debt is apportioned to each affordable unit/share and may be unsecured at the time of sale based on the unit/shares post-construction appraised value. In most cases, units/shares sold at full market value will not have any Subordinated Debt attributed to their units/shares. Purchasers repay the Subordinated City Debt attributable to their units/shares by delivering a note and mortgage and/or

conditional grant agreement to the City. The sum evidenced by the note and secured by the mortgage remains constant for the first five (5) years of a 15-year period and declines by one tenth (1/10) in years six (6) through fifteen (15) for each year of owner occupancy, but will be forgiven after the fifteenth (15) year of owner occupancy.

Upon resale or refinancing, initial purchasers and subsequent owners are required to make payments to the City out of resale profits and refinancing proceeds, where applicable. During years one (1) to five (5), 100% of the resale or refinancing profits from the sale of the unit must be paid up to the amount of the Subordinated City Debt. During years six (6) through fifteen (15), 50% of the resale or refinancing profits must be paid up to the amount of the outstanding Subordinated City Debt. The use and recapture of any State and Federal funds will be guided by the specific guidelines for such funding source.

Rental Projects

For a proposed rental component, the Subordinated City Debt attributable to both the residential and commercial, if any, components of the Project is repayable out of refinancing and resale profits and is non-evaporating.

9.6 Financing

It is the responsibility of the Developer to obtain construction and permanent financing in amounts consistent with the proposal. Proposals may include cash subsidy from HPD or The New York City Housing Development Corporation (HDC) that equals a total of no more than \$85,000 per unit (note: per unit amount is subject to change). This cash subsidy can be combined with financing available through various HDC programs and the Low Income Housing Tax Credit program. Respondents may also propose funding from the New York State Affordable Housing Corporation (AHC) Program, and the federal HOME Program. HOME funds will only be considered for projects that include homeownership. Developers may propose additional subsidy sources. Please see Appendix IV for financing term sheets.

Proposals will be evaluated based on the efficiency of the financing plan. Proposals that maximize affordability while minimizing subsidy will be given preference.

9.7 Property Use

The Site must be developed for mixed-use development. Stand-alone commercial development is not permitted. Affordable ownership units must be owner-occupied. Any resale within the fifteen (15) years following initial purchase of an affordable unit from the Development Team must be to a buyer who will be an owner-occupant and who will maintain the home as his/her primary residence. Any additional restrictions preserving the extent of affordability may be proposed.

9.8 Equal Opportunity

Agreements resulting from this RFP will be subject to the provisions of Executive Order 50 and its implementing regulations as stated in Appendix VII. A representative from the Development Team will be required to attend a class administered by HPD outlining the requirements of Executive Order 50 and to submit EO forms provided by HPD verifying their compliance with its provisions.

10.0 CONDITIONS, TERMS AND LIMITATIONS

This RFP is subject to the specific conditions, terms and limitations stated below:

The Site is to be disposed of in its "as is" condition. The City, its officers, agents and employees make no representation whatsoever as to the physical condition of the Site or its suitability for any specific use.

The Site shall be subject to New York City Real Property Taxes and charges. Tax exemption may be available under Article 16 of the New York State General Municipal Law, subject to approval by the City Council.

The proposed Project shall conform to, and be subject to, the provisions of the Zoning Resolution, Urban Renewal Plan, and all other applicable laws, regulations and ordinances of all Federal, State, and City authorities having jurisdiction, as the same may be amended from time to time.

Valid permits and approvals, as required by City, State and Federal agencies, shall be obtained by the Developer prior to commencing work.

The conditional designation of the Developer will depend on satisfaction of the additional documentation and review requirements described in this RFP and will be subject to the subsequent approval of the Mayor.

The City will convey the Site pursuant and subject to the provisions of the Land Disposition Agreement ("LDA"). HPD will recommend to the Mayor the acquisition price as stated. Where required, all documentation, including but not limited to the deed and LDA, shall be in form and substance satisfactory to the City Council, the Mayor, and the Corporation Counsel. The conveyance will be subject to satisfaction of the applicable provisions of the City Charter and Article 16 of the New York State General Municipal Law.

No transaction will be consummated if any Principal of the selected Developer is in arrears, or in default upon any debt, lease, contract or obligation to the City of New York, including without limitation real estate taxes and any other municipal liens or charges. The City reserves the right not to review any submission by any Respondent.

No commission for brokerage or any other fee or compensation shall be due or payable by the City, and the submission of a proposal will constitute the Respondent undertaking to indemnify and hold the City harmless from and against any such claim for any such fee or compensation based upon, arising out of, or in connection with any action taken by the Respondent, the selection of the Respondent's submission and invitation to the Respondent to respond to this RFP, the conditional designation of a Developer pursuant to this RFP or the sale of the Site.

The City is not obligated to pay nor shall in fact pay any costs or losses incurred by any Respondent at any time, including the cost of responding to the RFP, beyond the stipend described in Section 8.1.

The selection of a Development Team will mean only that HPD may commence negotiations with that Development Team regarding the development of the Development Site. HPD will send written notification (“Negotiation Letter”) to the selected Development Team. The selected Development Team must begin pre-development work within thirty (30) days of the date of the Negotiation Letter. **The selected Development Team will be expected to start construction on the date specified in their Post-Designation Timeline; however the Development Team must commence construction no later than eighteen (18) months from the date of the Negotiation Letter.**

This RFP does not represent any obligation or agreement whatsoever on the part of the City. Any obligation or agreement on the part of the City may only be incurred after the City enters into a written agreement approved by the Mayor and the Corporation Counsel. The City is under no legal obligation to convey the Development Site through a competitive process. The City may use the proposals submitted pursuant to this RFP as a basis for negotiation with the Development Team as the City deems appropriate. HPD may reject at any time any or all proposals, amend or withdraw this RFP in whole or in part, negotiate with one or more Respondents, and/or negotiate and dispose of the Development Site on terms other than those set forth herein (including to parties other than those responding to this RFP). HPD may also, at any time, waive compliance with, or change any of the terms and conditions of this RFP, entertain modifications or additions to selected proposals, or withdraw or add individual parcels from or to this RFP.

Selection of a Development Team’s Proposal will not create any rights on the Development Team’s part, including, without limitation, rights of enforcement, equity or reimbursement, until after the approvals of the City Council and the Mayor and the Corporation Counsel, and until the deed, LDA and all related documents are fully executed and approved. The terms of the deed and LDA, after execution, shall govern the relationship between the City and the Developer. In the event of any variance between the terms of this RFP and the deed or the LDA, the terms of the deed and/or LDA will govern.

The City reserves the right, in its sole discretion, to reject at any time any or all proposals, to withdraw the RFP, to negotiate with one or more Respondents, and/or negotiate and dispose of the Site on terms other than those set forth herein (including to parties other than those responding to this RFP). The City likewise reserves the right, at any time, to waive compliance with, or change any of the terms and conditions of this RFP or to entertain modifications or additions to selected proposals. In addition, HPD retains the right to at any time withdraw individual portions of the Site from this RFP and to add vacant lots to the Site.

All determinations as to the completeness or compliance of any proposal, or as the eligibility or qualification of any Respondent, will be within the sole discretion of the City.

The City advises all Respondents that there is no legal obligation on the part of the City to convey the Site offered through this RFP through a competitive process and that the City reserves the right to use the proposal submitted pursuant to this RFP as a basis for negotiation with Respondents as the City deems appropriate.

This RFP and any agreement resulting there from are subject to all applicable laws, rules and regulations promulgated by any Federal, State, or municipal authority having jurisdiction over the subject matter thereof, as the same may be amended from time to time.

11.0 CONFLICTS OF INTEREST

Employees of the City of New York may respond to this RFP only in accordance with Chapter 68 of the New York City Charter governing ethics and conflicts of interest affecting City personnel. Section 2604(b)(7) of the City Charter contains specific prohibitions that exclude enumerated groups of employees from participating in the sales process.

Persons in the employ of the City considering the submission of a proposal are advised that opinions regarding the propriety of their purchase of City-owned property may be requested from the New York City Conflicts of Interest Board. This body is empowered, under Section 2602 of the City Charter, to issue advisory opinions on conflict of interest questions and other matters of ethical considerations. It is not necessary, however, that such an opinion be obtained prior to responding to this RFP.

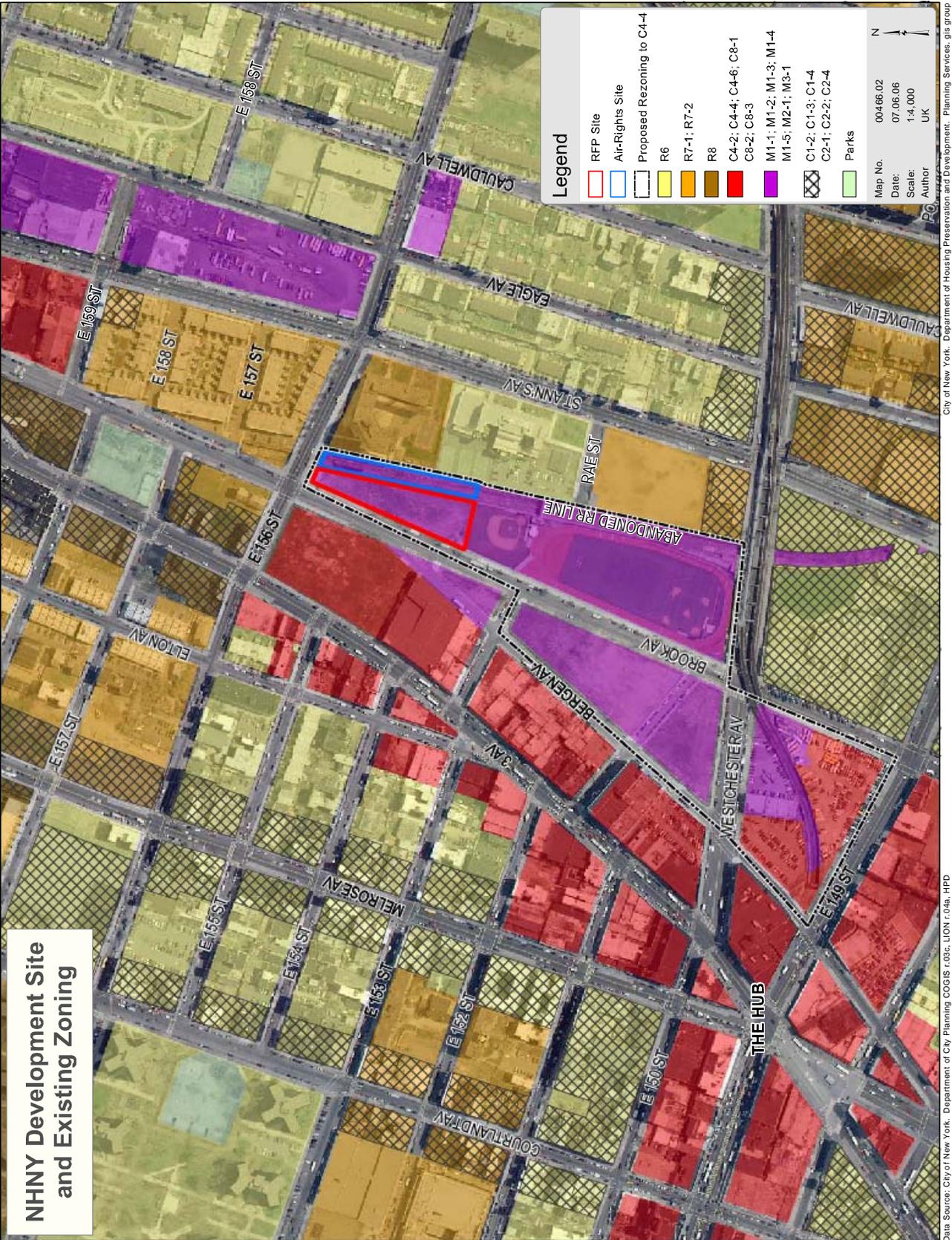
Former employees of the City of New York are also advised that the City Charter imposes certain restrictions on post-employment and business relationships with the City. Such individuals should consult the specific provisions on this issue contained in the City Charter.



Appendix I Site Maps



City of New York, Department of Housing Preservation and Development, Planning Services, GIS group



**NHNY Development Site
and Existing Zoning**

Data Source: City of New York, Department of City Planning, COGIS r.03c; LION r.04a; HPD
City of New York, Department of Housing Preservation and Development, Planning Services, gis group



The New Housing New York Steering Committee

Fredric Bell, FAIA, AIA New York Chapter
Lance Jay Brown, FAIA, City College of New York
Rex Curry, City College Architectural Center
Beatriz De La Torre, NYC Housing Preservation and Development
Simone Dennery, RA, NYC Housing Preservation and Development
Steven Faicco, RA, NYC Housing Preservation and Development
Dan Gorczyk, Granite Partners
Judy James Hernandez, NYC Housing Preservation and Development
Mark Ginsberg, FAIA, Curtis + Ginsberg Architects
Karen J. Y. Hu, NYC Housing Preservation and Development
Karen Kubey*, Curtis + Ginsberg Architects
Holly Leicht, NYC Housing Preservation and Development
Thomas McMahon, TLM Associates
David Resnick, AIA, NYC Department of Design and Construction
Mary Elizabeth Rusz, AIA, NYC Housing Authority
Tara Siegel*, Rose Fellow, Pratt Center
Evan Supcoff, AIA, HNTB Architecture
Susan Wright, AIA, Gruzen Samton

* Co-Chairs

Jurors

Shaun Donovan, Commissioner, NYC Housing Preservation and Development
David Burney, FAIA, Commissioner, NYC Department of Design and Construction
Lawrence Scarpa, AIA, Architect, Pugh + Scarpa
M. David Lee, FAIA, Adjunct Professor of Urban Design, Harvard School of Design
Mark Willis, Executive Vice President, JPMorgan Chase
Setha Low, Professor of Environmental Psychology and Anthropology, CUNY
Randolph R. Croxton, FAIA, Principal, Croxton Collaborative Architects, P.C.

Advisors

Helen Ng, Acumen Fund
Margaret Helfand, FAIA, Helfand Architect

Volunteers

Robert Bazewicz, Cosentini Associates
Aaron Dussair, Stephen Wang + Associates Architects
Jennifer Finley, Gresham Lang Garden Design
Katie Kozarek, Temenos Development Incorporated
Chi Ying Shen, Grimshaw Architects
Chris Teeter, Brennan Beer Gorman



Appendix III Project Design Goals

All respondents should strive to incorporate as many of the following design concepts into their proposals as possible.

A. NHNY Project Goals

1) Site Design

1. Open Spaces

- a. Provide usable areas where the community can meet and gather informally, such as at building lobby, common circulation or seating areas.
- b. Provide safe outdoor playground and exercise space with fitness equipment.
- c. Use patios, niches or balconies to encourage community interaction, provide eyes-on-the-street surveillance and areas for residents to customize their space and define identity.
- d. Provide for alternative transportation, e.g., bike paths and storage racks.
- e. Provide adequate street lighting around building to increase safety and incorporate attractive well-lit pedestrian paths wherever possible.
- f. Provide outdoor spaces for community gardens and/or planters for food, herbs and flowers.

2. Landscaping

- a. Use native plant species that thrive in the local climate with minimal irrigation.
- b. Use efficient irrigation systems such as drip, or a measured moisture level spray system that only goes off early morning.
- c. Minimize heat island effect at paved areas, i.e., provide a 40 percent shade coverage at tree maturity or provide alternate paving such as light colored, permeable or grass-covered pavement.

2) Building Design

1. Provide commercial space that promotes health, such as a food store that sells fresh produce and other healthy groceries.
2. Provide common spaces such as a community room, board room, fitness room with equipment, game room, children's play room, etc.
3. Provide water fountains accessible to tenants on first floor.
4. Illuminate public stairs and make them visible from the exterior and accessible on as many floors as possible according to fire code; if possible have security cameras or emergency call boxes in stairs to improve safety of stair use. Post signs that encourage and explain the health benefits of stair use.
5. Orient building for passive heat gain and cooling/natural ventilation. Provide shading devices, operable windows, shutters and thermal mass to fine-tune these strategies.

6. Maximize daylighting with windows and skylights.
7. Incorporate universal design principles, and child-friendly and senior-friendly design principles.
8. Meet or exceed the local requirements for accessibility.
9. Provide Internet connectivity for telecommuting.

B. HPD Design Guidelines for New Construction

HPD Design Guidelines for New Construction beyond those specified in this RFP are not mandatory and are included only as a reference tool. Their inclusion in Proposals is at the discretion of Finalist Teams as deemed appropriate. The HPD Design Guidelines for New Construction can be found at:

<http://www.nyc.gov/html/hpd/downloads/pdf/new-constr-guidelines.pdf>

C. Additional Sustainable Design Guidelines

Funding for sustainable building is available from the Enterprise Green Communities Grant. The Green Communities Criteria can be found at:

<http://www.greencommunitiesonline.org/GreenCriteria.pdf>



Appendix IV Financing Options

The table below lists a variety of New York State and New York City affordable housing programs that the respondent may consider to finance the proposed development. This is not an exhaustive list, as other financing options exist (for example, 4% as-of-right and 9% competitive Low-Income Housing Tax Credits). The NHNY Steering Committee encourages the creative use of financing options to provide the optimal outcome of quality, affordable mixed-income housing combined with innovative design. In addition, respondents should seek a financing option that is replicable for future affordable housing projects.

*Please note that various financing programs and terms are subject to change. The term sheets found in Appendix V are up-to-date as of 6/5/05. Please check the NHNY or HPD websites for updated information.

Funder	Type of Units	Financing Program	Maximum Subsidy/unit	Income Requirements
New York State Affordable Housing Corporation (NYS AHC)	Homeownership	AHC Subsidy	\$ 40,000	up to 90% of AMI
			\$ 32,500	up to 110% of AMI
			\$ 25,000	up to 130% of AMI
New York Housing Development Corporation (HDC) serves as the liaison for the AHC Subsidy program.	Rental	Low-Income Affordable Marketplace Program (LAMP)	\$ 55,000	up to 60% AMI; with 30% set-aside for formerly homeless households
	Rental	New Housing Opportunities Program (New HOP)	\$ 45,000	Maximum income requirements vary, but generally capped at 175% - 200% AMI
	Homeownership	Cooperative Housing Program	\$ 45,000	75% of units up to 175% AMI; 25% of units up to 250% AMI
City of New York Housing Preservation & Development (HPD)	Rental	Mixed Income Rental Program (MIRP)	\$ 50,000	up to 60% AMI; with 30% set-aside for formerly homeless households
	Rental	New Construction Participation Loan Program (PLP)	\$ 70,000	minimum 30% of units affordable to 60% AMI



Appendix V Financing Term Sheets*

HDC Low-Income Affordable Market-Place Program (LAMP)
HDC New Housing Opportunities Program (New HOP)
HDC Cooperative Housing Program

HPD New Construction Participation Loan Program

New York State Affordable Housing Corporation (AHC)

**Please note that various financing programs and terms are subject to change. The term sheets found in Appendix V are up-t-date as of 6/5/05. Please check the NHNY or HPD websites for updated information.*

I. HDC Low-Income Affordable Market-Place Program (LAMP)

Program Description

LAMP combines the use of tax exempt bond financing with as of right “4%” Federal Low Income Housing Tax Credits and other subsidies to produce housing affordable to those earning less than 60% of New York City’s median income.

Additionally, the Corporation provides subordinate loans of up to \$55,000/unit. These HDC subsidies also may be utilized in conjunction with subsidies provided by other agencies. For example, HDC second mortgage loans may be utilized in conjunction with several New York City Department of Housing Preservation and Development (HPD) programs, such as its Mixed Income Rental Program (MIRP), Section 421-a Negotiable Certificate Program and Participation Loan Program or with loans provided by the New York State Division of Housing and Community Renewal (DHCR) through its Homes for Working Families Program.

HDC bonds may be issued in a variety of interest rate modes, ranging from weekly variable rates to long-term fixed rates. Additionally, bonds may be issued as individual (“Stand Alone”) transactions or as part of a pooled financing under HDC’s Open Resolution.

Eligible Uses

New construction, substantial rehabilitation and conversions of non-residential buildings on an as-of-right-basis.

Maximum Income Limits

Lesser of 60% of area median income or as required by additional subsidy benefit providers.

First Mortgage Amount

During construction, tax exempt bonds subject to “Volume Cap” must fund more than 50% of the total development costs of the project. Permanent first mortgage amount will be set based on HDC underwriting criteria as set forth within.

First Mortgage Permanent Interest Rate

HDC permanent rate to be determined at construction loan closing. If permanent loan is part of “open resolution” pooled financing, the permanent rate will equal HDC’s cost of funds plus 70 basis points. If permanent loan is part of a “stand alone” transaction, the permanent rate will be determined by credit enhancer and all applicable fees (including 20 basis point for HDC servicing). Please call HDC staff for indicative rates.

Permanent Term

Up to 30 years.

Second Mortgage Amount

Up to \$55,000 per unit for projects reserving 30% of the units for homeless households.*

Up to \$45,000 per unit for projects reserving 10% of the units for homeless households.*

The second mortgage will bear an interest rate of at least 1%.

*Section 8 vouchers may be available for homeless households. Reference for homeless tenants must be obtained through HPD.

Amortization of HDC Second Mortgage

Balloons are permitted. However, preference will be awarded to projects that amortize the second mortgage over the term of the loan.

Loan to Value

First Mortgage: Not to exceed 75% based on an independent MAI appraisal (and reliance letter) acceptable to HDC. Combined first and second mortgage not to exceed 90% LTV.

Construction Period Credit Enhancement

Stand alone transaction: Direct-pay letter of credit from a financial institution rated at least A1/P1.

Open Resolution (fixed rate pooled financing): Stand by letter of credit from highly rated financial institution acceptable to HDC.

Permanent Credit Enhancement

Stand alone transaction: Direct-pay letter of credit from a financial institution rated at least A1/P1.

Open Resolution: SONYMA or REMIC may be required.

HDC Fee

.75% of first mortgage amount plus costs of issuance as determined by HDC.

Real Estate Tax Benefits

Enriched §421-a for new construction, enhanced J51 for rehabilitation and conversion projects. Projects in which a not-for-profit corporation has at least a 50% interest in the managing partner or member may be eligible for §420-c benefits.

Debt Service Coverage

125% or greater on HDC First Mortgage in open resolution.

120% on a stand alone transaction.

115% or greater on all financing.

Required Income to Expense Ratio

1.05 to 1 or greater on all financing.

Replacement Reserves

Minimum of \$250/unit/year, increased with CPI. Smaller projects may require higher replacement reserves.

Marketing

Marketing plan to be approved by HDC and HPD. Marketing process overseen by HPD with income certification by HDC.

Design Guidelines

Must meet HPD's Design Guidelines for New Construction/Substantial Rehabilitation and should conform to HDC's minimum unit sizes.

Recourse

HDC permanent loans are generally non-recourse to Borrower, except for environmental indemnity and standard non-recourse “carve out” Guaranty for fraud and related misrepresentation.

Items Required for Project Review

- Location and description of site & proposed development (including block and lots).
- Preliminary proforma including hard and soft costs, unit distribution and expected rents.
- Development team (borrower/GC/management company) and list of their experience and principals.

Conditions Precedent to Construction Loan Closing

- Completed and satisfactory disclosure documents for principals and known investors with more than 20% interest in the project. All members of a non-profit board must complete disclosure process
- Completed and satisfactory State Environmental Quality Review Act (SEQRA) review.
- Completed and satisfactory third party reports with reliance letters to HDC.
- Financial statements and credit reports.
- Final architectural plans reviewed and approved by HDC.
- Evidence of all other required funding.
- Commitment letter from the construction lender and other subordinate lenders.
- Assignment of Leases and Rents.
- Mortgage and Note.
- UCC's.
- Certifications and attorney opinion letters.
- Borrower's organizational documents.
- Property and Liability Insurance in form and substance acceptable to HDC.
- Good and marketable title, free and clear of encumbrances except as permitted by HDC.
- Title Insurance and Survey in form and substance acceptable to HDC.
- Documentation will require that HDC be named a beneficiary on a number of documents, including but not limited to insurance certifications and completion guarantees.

Conditions Precedent to Permanent Loan Closing

- 100% rental achievements/sales evidenced by certified rent roll.
- Evidence of rental estate tax benefits.
- Evidence of compliance with zoning and all applicable codes.
- Certification of “No Charge” in borrower's financial status.
- Certification of completion from construction lender's construction monitor.
- Evidence of Funds available for partial redemption of bonds.

HDC Contact

Rachel Grossman
Senior Vice President
Phone: (212) 227-9373
E-Mail: rgrossman@nychdc.com
110 William Street, 10th Floor
New York, NY 10038
FAX: (212) 227-6845
www.nychdc.com

II. **HDC New Housing Opportunities (New HOP)**

Program Description

The New York City Housing Development Corporation (HDC) finances construction and permanent mortgage loans for the new construction, substantial rehabilitation and as of right conversions of non-residential buildings to rental housing developments affordable to middle-income families.

Through New HOP, the proceeds from the sale of taxable bonds is used to provide long term fixed-rate permanent financing for rental developments affordable to middle-income families. HDC also provides subordinate loans of up to \$30,000/unit. However, under certain circumstances, subordinate loans of up to \$45,000/unit may be provided for developments with higher land costs, lower rents or larger units in accordance with the terms outlined herein.

Eligible Uses

New construction, substantial rehabilitation and conversions of non-residential buildings on an as-of-right-basis for developments containing a minimum of twenty (20) residential units.

Maximum Monthly Rents

Maximum Unit Type	Monthly Rents¹
Studio	\$1,045
1 BR	\$1,395
2 BR	\$1,810
3 BR	\$2,110

1) Developments with lower rents may qualify for second mortgages in excess of \$30,0000 unit. Refer to the HDC Second Mortgage Amount below.

Maximum Income Limits

Seven times annual rent for 1-2 person households; eight times for households of 3 or more up to a maximum of 175% of median income for 75% of the units and 200% for 25% of the units. (Specific units will be designated for each level prior to marketing).

Construction Period Credit Enhancement

Stand-by Letter of Credit (LOC) from a highly rated financial institution acceptable to HDC

First Mortgage Permanent Interest Rate

Interest rates on long-term first mortgages established at bond sale based on market conditions. Indicative taxable bond rates can be obtained by calling the development staff at HDC.

Second Mortgage Permanent Interest Rate

1%

Permanent Term

Up to 30 years

First Mortgage Amount

Not to exceed 80% of value. Higher amounts will be considered and may require third party credit enhancement.

HDC Second Mortgage Amount

\$30,000/unit. HDC will consider providing second mortgages of up to \$45,000/unit, in certain circumstances (i.e. high land costs, larger unit types or lower rents):

1) Higher Acquisition Costs²:

Acquisition	Maximum Subsidy
\$20,000/unit or less	up to \$30,000/unit and up to \$5,000,000/project
\$20,001/unit or more	For every \$1.00 increase in the <i>recognized acquisition cost</i> ³ above \$20,000/unit, the maximum subsidy may be increased by \$.50, up to \$45,000/unit, not to exceed \$7,500,000/project

2) Only projects qualifying for a larger second mortgage because of higher acquisition costs are subject to a per project maximum.

3) *Recognized acquisition cost* equals the lesser of the actual price paid for the property or the "as-is" land value as determined by a third party appraiser.

2) Lower Rents

MAXIMUM SUBSIDY RANGES			
Unit Type	Up to \$30,000/unit or \$5,000,000/project	Up to \$37,500/unit or \$6,250,000/project	Up to \$45,000/unit or \$7,500,000/project
Studio	\$921-1,045	\$746-920	\$745 or less
1 BR	\$1,171-1,395	\$971-1,170	\$970 or less
2 BR	\$1,461-1,810	\$1,186-1,460	\$1,185 or less
3 BR	\$1,736-2,110	\$1,411-1,735	\$1,410 or less

3) Larger Unit Types:

% of Units Containing two or more bedrooms	Maximum Second Mortgage Amount
50%	Up to \$37,500/unit
75%	Up to \$45,000/unit

4) Lower Rents and Larger Unit Types:

A project may also qualify for up to \$45,000/unit if it meets both of the following:

(1) Rents set below the maximum set-forth below:

Studio	up to \$ 920
1BR	up to \$1,170
2BR	up to \$1,460
3BR	up to \$1,735

and

(2) 50% of units containing two (2) or more bedrooms.

Loan to Value

Combined loan to value not to exceed 95% as established by an independent MAI appraisal acceptable to HDC.

Loan to Cost

Combined loan to cost may not exceed 90%.

HDC Fee

.75% of the HDC first loan amount plus costs of issuance as determined by HDC.

Collateral

First and/or second mortgage on land and improvements.

Other Subordinate Liens

Permitted with HDC approval of terms.

Amortization

First mortgage fully amortized over the term of the loan. Second mortgage may be interest only although preference will be given to projects which permit full amortization of HDC subordinate financing. Amortization on the second mortgage may be increased at permanent conversion in certain circumstances (see Rent/Loan Increases below).

Minimum Equity

At least 10% of total development cost. No more than 50% of the minimum equity requirement may be met through the pledge of developer's fee. Preference will be given to proposals with greater equity contributions.

Maximum Developer's Fee

Not to exceed 15% of non-subsidized development cost.

Real Estate Tax Benefits

Enriched §421-a for new construction, standard or enhanced J-51 for rehabilitation and conversion projects. To receive enhanced J-51 benefits, project must restrict incomes to 165% of AMI, or 20% of the units can be set at 80% of AMI with the remaining units at 180% of AMI.

Note: Only projects located north of East/West 96th Street for all rehabilitation projects as well as for new construction projects located east of Fifth Avenue and new construction projects west of Fifth Avenue located north of West 110th Street are eligible for full tax abatements.

Debt Service Coverage

115% or greater on all financing.
120% or greater on HDC first mortgage.

Income to Expense Ratio

1.05 to 1 or greater on all financing.

Mortgage Insurance

May be required for permanent mortgage. This requirement can be satisfied with partial REMIC mortgage insurance. Alternate mortgage insurance from SONYMA, HUD or other highly rated entities may be required for projects requiring a first mortgage in excess of \$20,000,000.

Replacement Reserve

Minimum of \$250/unit/year increased with CPI. Smaller projects may require higher replacement reserves.

Design Guidelines

In addition to meeting HPD's Design Guidelines for New Construction/Substantial Rehabilitation, New HOP projects should meet the following overall square footages per apartment type:

Studio	400 sq. ft.
1-Bedroom	575 sq. ft.
2-Bedroom	775 sq. ft.
3-Bedroom	950 sq. ft.

Marketing

Must comply with all HDC marketing guidelines. Guidelines can be found on HDC website or by calling John Simons in HDC's Asset Management Department.

Rent/Loan Increases

Rent increases may be permitted at the time of marketing. Any rent increase must be

approved by HDC prior to the commencement of marketing. Increased rents must be in conformance with the HDC maximum allowable rents in effect at the time of marketing. A portion of the additional cash flow earned from these rent increases will be used to accelerate the amortization of the second mortgage.

If the additional income is sufficient and funds are available, an increase in the first mortgage may be permitted as well.

Recourse

HDC permanent loans are generally non-recourse to Borrower, except for environmental indemnity and standard non-recourse "carve out" Guaranty for fraud and related misrepresentation.

Items Required for Project Review

- Location and description of site & proposed development (including block and lots).
- Preliminary proforma including hard and soft costs, unit distribution and expected rents.
- Development team (borrower/GC/management company) and list of their experience and principals.

Conditions Precedent to Construction Loan Closing

- Completed and satisfactory disclosure documents for principals and known investors with more than 20% interest in the project.
- Completed and satisfactory State Environmental Quality Review Act (SEQRA) review.
- Completed and satisfactory third party reports with reliance letters to HDC.
- Financial statements and credit reports.
- Construction Lender Loan Offering Package.
- Commitment letter from the construction lender and other subordinate lenders.
- Assignment of Leases and Rents.
- Mortgage Note and UCC's.
- Certifications and attorney opinion letters.
- Borrower's organizational documents
- Property and Liability Insurance in form and substance acceptable to HDC.
- Good and marketable title, free and clear of encumbrances except as permitted by HDC.
- Title Insurance and Survey in form and substance acceptable to HDC.
- Documentation will require that HDC be named a beneficiary on a number of documents, including but not limited to insurance certifications and completion guarantees.

Conditions Precedent to Closing Permanent Mortgage

- 100% rental achievement/sales evidenced by certified rent roll.
- Evidence of real estate tax benefits.
- Evidence of compliance with zoning and all applicable codes.
- Certification of "No Change" in borrower's financial status.
- Certificate of completion from construction lender's construction monitor.

HDC Contact:

Rachel Grossman, Senior Vice President

Phone: (212) 227-9373

E-Mail: rgrossman@nychdc.com

110 William Street, 10th Floor

New York, New York 10038

Phone:(212) 227-5500

FAX: (212) 227-6845

www.nychdc.com

III. HDC Affordable Cooperative Housing Program

Program Description

The New York City Housing Development Corporation (“HDC”), has implemented an initiative to offer an attractive lending program to finance affordable cooperative developments. Under this program, an approved lender will provide the construction financing for cooperative developments affordable to middle income families. HDC will also provide subordinate financing ranging from \$30,000 to \$45,000 per unit as determined by program guidelines during construction. Upon construction completion and achievement of sufficient sales, HDC will provide a permanent loan that will be funded by taxable bonds which will be blended with the HDC subordinate financing for a 1st position mortgage. The interest rate on the bonds will be set at construction loan closing and the permanent loan must be insured by SONYMA. Insurance coverage from SONYMA is required prior to the construction loan closing.

Mortgage Insurer

SONYMA - State of New York Mortgage Agency

Participating Construction Lenders

Bank of America, JP Morgan Chase, and Citibank

Purpose

The new construction substantial rehabilitation or conversion of existing buildings creating affordable cooperative housing developments.

Eligible Sites:

Privately owned or formerly city owned properties are eligible with a minimum of 50 units.

Income Eligibility:

Not to exceed 175% of median income for 75% of the units and 250% for 25% of the units. (Specific units will be designated for each level prior to marketing.) All projects are subject to HDC's marketing guidelines, which include income verification and a lottery process for initial applicants.

Unsubsidized Units:

HDC will also allow up to 25% of the units to be sold at market rate prices without any income restrictions. HDC's 1% loan funds will not be available for these units, and the costs and sales proceeds from these units will not be subject to the 15% developer's fee. Please be advised that the developer should ascertain whether market rate units will impact the tax abatement for the proposed cooperative.

Construction Lending

Private for profit or not-for-profit experienced developers. Subject to all underwriting and credit approvals as set forth by the program and BAC and HDC's credit policies.

The construction lender will co-underwrite with HDC individual construction loans. HDC will provide low-interest subordinate 2nd mortgage construction loans.

Maximum LTV on 1st Mtg: 80% LTV
Maximum combined LTV: 95%LTV
Minimum DSC on 1st Mtg: 1.20 under rental fallback scenario
Minimum DSC on combined debt:1.15 under rental fallback scenario

Pricing / Interest Rate

Construction Loan Fee 1%
HDC- 1.0% upfront on the HDC Subordinate loan and 1% at conversion on HDC loan.

Individual construction loan pricing to be negotiated directly with the Construction Lender.

Construction Term

General term of 24 months from closing of construction loan – no extension options.
However, the initial tem can be set during underwriting for a term of up to 30 months.

General

Underwriting including payment and completion guaranty will be required on all developments from the borrowers, principals. General Contractors shall also provide a guaranty of completion. Payment and Performance Bonds or such other instruments may be required at the discretion of Construction Lender and HDC.

SONYMA

SONYMA commitment must be in place at closing of the construction loan - or must have received SONYMA Board approval

Fees: .10% of permanent loan
Annual premium - .50% of outstanding loan amount - will be included in permanent interest rate.

Co-op Plan Declaration of Effectiveness

Achievement of 75% sales contracts are required to declare the cooperative effective.

Permanent Take-out

Permanent bond rate shall be locked in at time of construction loan closing.

Required Underwritten Debt Service Coverage

1.05

Minimum Income to Expense Ratio

1.00 to 1.00

Sinking Funds

Any funds collected by HDC from shareholder resale profits will be deposited into a sinking fund and used as a pre-payment on the HDC subsidy. Resale profits are considered to mean 100% of a unit's net appreciation during years 1-3, and 50% of the unit's net appreciation during years 4-15 from the HDC conversion date.

Term

30 year loan term with 30 year amortization schedule

Amortization

Bond proceeds will be fully amortized over the term of the loan. HDC’s 1% funds can be interest only with a balloon due at the end of 30 year term.

HDC Subordinate Mortgage Amount

\$30,000/unit. HDC will consider providing subordinate mortgages up to \$45,000/unit, in certain circumstances (i.e., projects with high land costs or larger unit types):

1) Higher Acquisition Costs¹:

Acquisition	Maximum Subsidy
\$20,000/unit or less	up to \$30,000/unit and up to \$5,000,000/project
\$20,001/unit or more	For every \$1.00 increase in the <i>recognized acquisition cost</i> ² above \$20,000/unit, the maximum subsidy may be increased by \$.50, up to \$45,000/unit, not to exceed \$7,500,000/project

1) Only projects qualifying for a larger subordinate mortgage because of higher acquisition costs are subject to a per project maximum.

2) Recognized acquisition cost equals the lesser of the actual price paid for the property or the “as-is” land value

as determined by a third-party appraiser.

2) Larger Unit Types:

% of Units containing two (2) or more bedrooms	Maximum Subsidy
50%	Up to \$37,500/unit or \$6,250,000/project
75%	Up to \$45,000/unit or \$7,500,000/project

Collateral

First and second mortgage on land and improvements.

Minimum Equity

At least 5% of total development cost at construction loan closing.

Maximum Developer's Fee

Not to exceed 15% of non-subsidized development cost. *(It should be noted that the use of other programs in conjunction with HDC financing may limit the developer's fee to 10%.)*

Real Estate Tax Benefits

Enriched §421-a for new construction, standard or enhanced J-51 for rehabilitation and conversion projects. To receive enhanced J-51 benefits project must restrict incomes to 165% of AMI, or 20% of the units can be set at 80% of AMI with the remaining units at 180% of AMI.

Capitalized Operating Reserve

Minimum of \$1,000 per unit will be capitalized by HDC at permanent conversion.

Replacement Reserve

Minimum of \$250/unit/year increased with CPI. Smaller projects may require higher replacement reserves.

Design Guidelines

In addition to meeting HPD's Design Guidelines for New Construction/Substantial Rehabilitation, Cooperative projects should meet or exceed the following minimum overall square footages per apartment type:

Studio:	400 sq. ft.
1-Bedroom:	575 sq. ft.
2-Bedroom:	775 sq. ft.
3-Bedroom:	950 sq. ft.

Marketing

Must comply with all HDC marketing guidelines. Guidelines can be found on HDC website or by calling John Simons in HDC's Asset Management Department.

Items Required for Project Review

- Location and description of site & proposed development (including block and lots).
- Preliminary proforma including hard and soft costs, unit distribution, anticipated maintenance charges, and expected sales prices.
- Development team (borrower/GC/management company) and list of their experience and principals.
- Financial statements of borrower

Conditions Precedent to Construction Loan Closing:

- Completed and satisfactory disclosure documents for principals and known investors with more than 20% interest in the project.
- Completed and satisfactory State Environmental Quality Review Act (SEQRA) review.
- Completed and satisfactory third party reports with reliance letters to HDC.
- Financial statements and credit reports.
- Final architectural plans reviewed and approved by HDC.
- Construction Lender Loan Offering Package.
- Commitment letter from the construction lender and other subordinate lenders.
- Mortgage and Note.
- UCC's.
- Certifications and attorney opinion letters.
- Borrower's organizational documents.
- Property and Liability Insurance in form and substance acceptable to Construction Lender and HDC.
- Good and marketable title, free and clear of encumbrances except as permitted by Construction Lender and HDC.
- Title Insurance and Survey in form and substance acceptable to Construction Lender and HDC.
- Documentation will require that HDC be named a beneficiary on a number of documents, including but not limited to insurance certifications and completion guarantees.

Conditions Precedent to Closing Permanent Mortgage:

- Minimum 75% sales evidenced by sales contracts approved by HDC. An escrow will be held by HDC for any units not considered sold at the time of conversion.
- Effective SONYMA insurance.
- Evidence of real estate tax benefits.
- Evidence of compliance with zoning and all applicable codes.
- Certification of "No Change" in borrower's financial status.
- Certificate of completion from construction lender's construction monitor.

HDC Contact:

Rachel Grossman, Senior Vice President

Phone: (212) 227-9373

E-Mail: rgrossman@nychdc.com

110 William Street, 10th Floor

New York, New York 10038

Phone:(212) 227-5500

FAX: (212) 227-6845

www.nychdc.com

III. HPD New Construction Participation Loan Program

Equity Requirements

Minimum of 10% of total allowable development costs for for-profit developers, and 2% for non-profit developers.

Construction Costs

Negotiated price approved by delegated lender. Negotiated price approved by HPD if NHS is the lender.

Maximum Subsidy

The maximum HPD loan is \$70,000 per unit.

Construction Contingency

5% of construction costs

Developer Fees

There are no developer fees.

Borrower's Architect Fee

Maximum of 5.5% of construction costs not including contingency.

Rents

30% of units must be affordable to households at 60% of area median income (AMI). However, if Federal HOME funds are used, 30% of the units must be affordable to families earning no more than 65% of AMI; in projects with 15 units or more, a minimum of 20% of the HOME units must be affordable to families earning no more than 50% of AMI. The remainder of the rents will be set at market rate for the area.

City Capital Construction Interest Rate

The interest rate on the City Capital portion of the construction loan will be 1% plus a .25% servicing fee.

City Capital Permanent Interest Rate

The interest rate on the City Capital portion of the construction loan will be 1%.

Permanent Term

Up to 30 years.

Loan to Value

There are no restrictions on the loan to value on the City portion of the loan.

Debt Coverage Ratio

1.15 is the required DCR on all financing. Typically, the private loan will require a DCR between 1.25 and 1.30.

Letter of Credit

10% of hard costs excluding contingency. All contracts must be secured by a letter of credit, blocked account, or cash deposit.

HPD Contact:

Lauren Dietz

Phone: (212) 227-5942

E-Mail: dietzl@hpd.nyc.gov

100 Gold Street, Room 9P-8

New York, New York 10038

www.nyc.gov/hpd

IV. New York State Affordable Housing Corporation

The New York State Affordable Housing Corporation (AHC), a subsidiary of the New York State Housing Finance Agency, pursuant to Section 1113(1) of the Private Housing Finance Law, was established to administer the Affordable Home Ownership Development Program ("Program").

The purpose of the Program is to promote home ownership by persons of low and moderate income, which, in turn, fosters development, stabilization, and preservation of neighborhoods and communities. To achieve these goals, AHC provides financial assistance, in conjunction with other private and public investment, for the construction, acquisition, rehabilitation, and improvement of owner-occupied housing.

AHC may provide grants within the following per dwelling unit limitations: up to \$20,000 per unit, or \$25,000 per unit within the limits of available funding, per unit for projects located in high cost areas as defined by the Corporation, or projects receiving a U.S. Department of Agriculture Rural Development Service (formerly the Farmer's Home Administration) Loan. To encourage the leveraging of other private and public funds, AHC grants cannot exceed 60% of the total project development cost. By reducing development and rehabilitation costs, assistance provided under the Act by AHC makes home ownership affordable to families and individuals for whom there are no other reasonable and affordable home ownership alternatives in the private market. Additionally, the development and rehabilitation activities undertaken in connection with this Program are intended to help eliminate conditions of blight and deterioration and to create jobs and stability in communities throughout the State.

Eligible applicants include: local Municipalities, housing authorities, housing development fund companies, neighborhood and rural preservation companies, as well as, not-for-profit or charitable organizations primarily involved in housing development.

AHC works with its parent Agency, HFA, and its sister Agency, the State of New York Mortgage Agency (SONYMA) to increase homeownership opportunities. As part of the Agency's policy of one-stop shopping the SONYMA Project Set-Aside application has been incorporated into the AHC application.

For more information about the Affordable Housing Corporation and to check for Notice of Funding Availability go to <http://www.nyhomes.org/ahc/ahc.htm>



All HPD development projects are leased through a lottery system monitored by HPD's marketing department. Market-rate units will not be subject to the HPD lottery.

Marketing Preferences:

- Applicants who are residents of the community board in which the project is being built will receive preferential consideration for 50% of the apartments.
- Mobility-impaired applicants will receive preferential consideration for 5% of the apartments.
- Visually and hearing impaired applicants will receive preferential consideration for 2% of the apartments.
- Active New York City Police Officers will receive preferential consideration for 5% of the apartments.
- Other Public Employees will receive preferential consideration for 5% of the apartments.



THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, N.Y. 10007

EXECUTIVE ORDER NO. 50

APRIL 25, 1980

BUREAU OF LABOR SERVICES

By the power vested in me as Mayor of the City of New York,
it is hereby ordered:

Section 1. Purpose. It is the purpose of this Order to ensure compliance with the equal employment opportunity requirements of City, State and Federal law in City contracting.

§ 2. Bureau Continued. The Bureau of Labor Services shall continue to serve such purposes and to have such responsibilities as restated by this Order.

§ 3. Definitions. Whenever used in this Executive Order, the following terms shall have the following meanings:

- (a) Bureau means the Bureau of Labor Services;
- (b) construction project means any construction, reconstruction, rehabilitation, alteration, conversion, extension, improvement, repair or demolition of real property contracted by the City;
- (c) contract means any written agreement, purchase order or instrument whereby the City is committed to expend or does expend funds in return for work, labor, services, supplies, equipment, materials, or any combination of the foregoing;

*amended
F.C. 94*

(i) Unless otherwise required by law, the term "contract" shall include any City grant, loan, guarantee or other City assistance for a construction project.

(ii) The term "contract" shall not include:

(A) contracts for financial or other assistance between the City and a government or government agency;

(B) contracts, resolutions, indentures, declarations of trust, or other instruments authorizing or relating to the authorization, issuance, award, and sale of bonds, certificates of indebtedness, notes or other fiscal obligations of the City, or consisting thereof; or

(C) employment by the City of its officers and employees which is subject to the equal employment opportunity requirements of applicable law.

(d) contracting agency means any administration, board, bureau, commission, department or other governmental agency of the City of New York, or any official thereof, authorized on behalf of the City to provide for, enter into, award or administer contracts;

(e) contractor means a person, including a vendor, who is a party or a proposed party to a contract with a contracting agency, first-level subcontractors of supply or service contractors, and all levels of subcontractors of construction contractors;

(f) Director means the Director of the Bureau of Labor Services;

(g) economically disadvantaged person means a person who, or a member of a family which, is considered economically disadvantaged under applicable law.

(h) employment report means a report filed by a contractor containing information as to the employment practices, policies and programs, employment statistics and collective bargaining agreements, if any, of the contractor in such form as the Bureau may direct by regulation;

(i) equal employment opportunity means the treatment of all employees and applicants for employment without unlawful discrimination as to race, creed, color, national origin, sex, age, handicap, marital status, sexual orientation or affectional preference in all employment decisions, including but not limited to recruitment, hiring, compensation, training and apprenticeship, promotion, upgrading, demotion, downgrading, transfer, lay-off and termination, and all other terms and conditions of employment except as provided by law;

(j) trainee means an economically disadvantaged person who qualifies for and receives training in one of the construction trades pursuant to a program other than apprenticeship programs, approved by the Bureau and, where required by law, the State Department of Labor or the United States Department of Labor, Bureau of Apprenticeship and Training.

§ 4. Responsibilities of Bureau. The responsibilities of the Bureau shall be as follows:

(a) To implement, monitor compliance with, and enforce this Order and programs established pursuant to City, State and Federal law requiring contractors to provide equal employment opportunity;

(b) To implement, monitor compliance with, and enforce on-the-job training requirements on construction projects;

(c) To monitor compliance by contractors with State and Federal prevailing wage requirements where required;

(d) To advise and assist contractors and labor unions with respect to their obligations to provide equal employment opportunity;

(e) To advise and assist persons in the private sector with respect to employment problems;

(f) To establish advisory committees, including representatives of employers, labor unions, community organizations and others concerned with the enforcement of this Order; and

(g) To serve as the City's principal liaison to Federal, State and local contract compliance agencies.

§ 5. Contract Provisions.

(a) Equal Employment Opportunity. A contracting agency shall include in every contract to which it becomes a party such provisions requiring the contractor to ensure equal employment opportunity as the Bureau may direct by regulation.

(b) On-the-Job Training. A contracting agency shall include in every contract concerning a construction project to which it becomes a party such provisions requiring the contractor to provide on-the-job training for economically disadvantaged persons as the Bureau may direct by regulation.

(c) Subcontractors. A contracting agency shall include in every contract to which it becomes a party such provisions requiring the contractor not to discriminate unlawfully in the selection of subcontractors as the Bureau may direct by regulation.

§ 6. Employment Reports.

(a) Submission Requirements. No contracting agency shall enter into a contract with any contractor unless such contractor's employment report is first submitted to the Bureau for its review. Unless otherwise required by law, an employment report shall not be required for the following:

(i) a contract in the amount of \$50,000 or less;

(ii) an emergency contract or other exempt contract except as the Bureau may direct by regulation; and

(iii) a contract with a contractor who has received a certificate of compliance with the equal employment opportunity requirements of applicable law from the Bureau, or an appropriate agency of the State of New York or the United States within the preceding twelve months, except as the Bureau may direct by regulation.

(b) Bureau Review. The Bureau shall review all employment reports to determine whether contractors are in compliance with the equal employment opportunity requirements of City, State and Federal law and the provisions of this Order. The contracting agency shall transmit the employment report to the Bureau within ten business days after the selection of a proposed contractor. A contracting agency may thereafter award a contract unless the Bureau gives prior written notice to the contracting agency and the contractor as follows:

(i) If the Bureau notifies the contracting agency and the contractor within five business days after the receipt by the Bureau of the employment report that the contractor has failed to submit a complete employment report, the Director may require the contracting agency to disapprove the contractor unless such deficiency is corrected in a timely manner;

(ii) If the Bureau notifies the contracting agency and the contractor within fifteen business days of the receipt by the Bureau of the completed employment report that the Bureau has found reason to believe that the contractor is not in substantial compliance with applicable legal requirements and the provisions of this Order, the Bureau shall promptly take such action as may be necessary to remedy the contractor's noncompliance as provided by this Order.

Provided that a contracting agency may award a requirements contract or an open market purchase agreement prior to review by the Bureau of the contractor's employment report, but may not make a purchase order against such contract or agreement until it has first transmitted such contractor's employment report to the Bureau and the Bureau has completed its review in the manner provided by this Section.

(c) Employment Program. The Bureau may require a contractor to adopt and adhere to a program designed to ensure equal employment opportunity.

(d) Periodic Reports. Contractors shall file periodic employment reports after the award of a contract in such form and frequency as the Bureau may direct by regulation to determine whether such contractors are in compliance with applicable legal requirements and the provisions of this Order.

§ 7. Training Programs. The Bureau shall monitor the recruitment, training and placement of economically disadvantaged persons in on-the-job training programs on construction projects. Contracting agencies shall require contractors to make a good faith effort to achieve the ratio of one trainee to four journey-level employees of each craft on each construction project.

(a) The Bureau shall determine the number of trainees and hours of training required by each contractor or subcontractor for each construction project.

(b) In the event that a contractor fails to make a good faith effort to train the required number of individuals for the required amount of hours, the Bureau, after consultation with the contracting agency, shall direct such agency to reduce the contractor's compensation by an amount equal to the amount of wages and fringe benefits which the contractor failed to pay to trainees.

(c) On-the-job training of economically disadvantaged persons shall not be required on construction contracts in the amount of \$125,000 or less.

§ 8. Compliance Investigations and Hearings. The Bureau shall conduct such investigations and hold such hearings as may be necessary to determine whether contractors are in compliance with the equal employment opportunity requirements of City, State and Federal law and the provisions of this Order.

(a) Voluntary Compliance. The Bureau shall seek to obtain the voluntary compliance of contractors and labor unions with applicable legal requirements and the provisions of this Order.

(b) Noncompliance. Upon receiving a complaint or at its own instance, the Bureau shall determine whether there is reason to believe a contractor is not in compliance with applicable legal requirements and the provisions of this Order.

(c) Hearings. The Bureau shall hold a hearing on prior written notice to a contractor and the contracting agency before any adverse determination is made with respect to such contractor's employment practices or imposing any sanction or remedy for non-compliance with applicable legal requirements and the provisions of this Order. The hearing shall be held before a City hearing officer, or such other person designated by the Director, who shall submit a report containing findings of fact and recommendations to the Director. Based on the record as a whole, the Director shall determine whether a contractor has failed to comply with applicable legal requirements or the provisions of this Order and the appropriate sanctions for noncompliance.

(d) Notices. The Bureau shall give prior notice of any hearing and shall provide a copy of any hearing report and determination of the Director under paragraph (c) of this Section to the contracting agency, the Corporation Counsel and the Comptroller. The Bureau shall notify appropriate City, State and Federal agencies of violations of law and may, with the approval of the Corporation Counsel, initiate proceedings in such agencies.

§ 9. Sanctions and Remedies. After making a determination that a contractor is not complying with applicable legal requirements and the provisions of this Order, the Director may direct that such sanctions as may be permitted by law or contractual provisions be imposed, including the disapproval of a proposed contractor, the suspension or termination of a contract and the reduction of a contractor's compensation, except as follows:

(a) Within five business days of the issuance of a determination by the Director under Section 8(c), a contracting agency head may file with the Director written objections to the sanctions to be imposed. Where such objections have been filed, the Director and the contracting agency head shall jointly determine the appropriate sanctions to be imposed.

(b) In lieu of any of the foregoing sanctions, the Director may require a contractor to adopt and adhere to a program to ensure equal employment opportunity.

§ 10. Public Agencies. Any administration, board, bureau, commission, department or other public agency, not subject to this Order, which imposes by rule, regulation or order equal employment opportunity requirements, may, with the consent of the Mayor, delegate such responsibilities to the Bureau as may be consistent with this Order.

§ 11. Confidentiality. To the extent permitted by law and consistent with the proper discharge of the Bureau's responsibilities under this Order, all information provided by a contractor to the Bureau shall be confidential.

§ 12. Regulations. The Bureau shall promulgate such regulations, subject to the approval of the Mayor, as may be necessary to discharge its responsibilities under this Order, including regulations increasing the dollar amounts referred to in this Order. Any regulations of the Bureau establishing terms and conditions for contractors shall be approved as to form by the Corporation Counsel.

§ 13. Annual Report. The Bureau shall submit an annual report to the Mayor concerning its responsibilities under this Order.

§ 14. Separability. If any provision of this Order or the application thereof is held invalid, the remainder of this Order and the application thereof to other persons or circumstances shall not be affected by such holding and shall remain in full force and effect.

§ 15. Revocation of Prior Orders. Executive Orders No. 71 (1968), No. 20 (1970), No. 23 (1970), No. 27 (1970), No. 31 (1971), No. 74 (1973), No. 7 (1974), and No. 80 (1977) are hereby revoked and the first paragraph of Section 2 of Executive Order No. 4 (1978) is hereby deleted. Nothing in this Order shall be deemed to relieve any person of any obligation not inconsistent with this Order assumed or imposed pursuant to an Order superseded by this Order.

§ 16. Effective Date. This Order shall take effect immediately.


EDWARD I. KOCH
M A Y O R

EQUAL EMPLOYMENT OPPORTUNITY

This contract is subject to the requirements of Executive Order No. 50 (1980) as revised ("E.O.50") and the Rules and Regulations promulgated thereunder. No contract will be awarded unless and until these requirements have been complied with in their entirety. By signing this contract, the contractor agrees that it:

(1) will not engage in any unlawful discrimination against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, rates of pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment;

(2) the contractor agrees that when it subcontracts it will not engage in any unlawful discrimination in the selection of subcontractors on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation;

(3) will state in all solicitations or advertisements for employees placed by or on behalf of the contractor that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, disability, marital status or sexual orientation, or that it is an equal employment opportunity employer;

(4) will send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or memorandum of understanding, written notification of its equal employment opportunity commitments under E. O. 50 and the rules and regulations promulgated thereunder; and

(5) will furnish all information and reports including an Employment Report before the award of the contract which are required by E. O. 50, the rules and regulations promulgated thereunder, and orders of the Director of the Bureau of Labor Services ("Bureau"), and will permit access to its books, records and accounts by the Bureau for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

The contractor understands that in the event of its noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of the contract and noncompliance with the E.O. 50 and the rules and regulations promulgated thereunder. After a hearing held pursuant to the rules of the Bureau, the Director may direct the imposition by the contracting agency held of any or all of the following sanctions:

- (i) disapproval of the contractor;
- (ii) suspension or termination of the contract;
- (iii) declaring the contractor in default; or
- (iv) in lieu of any of the foregoing sanctions, the Director may impose an employment program.

The Director of the Bureau may recommend to the contracting agency head that a Board of Responsibility be convened for purposes of declaring a contractor who has repeatedly failed to comply with E.O. 50 and the rules and regulations promulgated thereunder to be nonresponsible.

The contractor agrees to include the provisions of the foregoing paragraphs in every subcontract or purchase order in excess of \$50,000 to which it becomes a party unless exempted by E.O. 50 and the rules and regulations promulgated thereunder, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Director of the Bureau of Labor Services as a means of enforcing such provisions including sanctions for noncompliance.

The contractor further agrees that it will refrain from entering into any contract or contract modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a subcontractor who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder."



THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, N.Y. 10007

Executive Order No. 108
December 29, 1986

Amendment of Executive Order No. 50
(April 25, 1980)

BUREAU OF LABOR SERVICES

By the power vested in me as Mayor of the City of New York,
it is hereby ordered:

Section 1. Prior Order Amended.

a. Section 6(a) of Executive Order No. 50, dated
April 25, 1980, is amended to read as follows:

"Submission Requirements. No contracting
agency shall enter into a contract with any
contractor unless such contractor's
employment report is first submitted to the
Bureau for its review. Unless otherwise
required by law, an employment report shall
not be required for the following:

(i) a construction contract in the
amount of less than \$1 million; a
construction subcontract in the amount of
less than \$750,000; or a supply and service
contract in the amount of \$50,000 or less
or of more than \$50,000 in which the
contractor employs fewer than 50 employees
at the facility or facilities involved in
the contract;

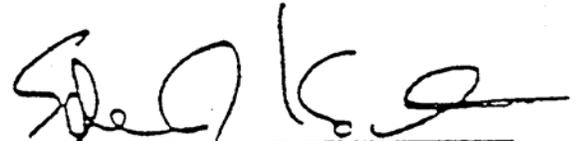
(ii) an emergency contract or other
exempt contract, except as the Bureau may
direct by regulation; and

(iii) a contract with a contractor who has received a certificate of compliance with the equal employment opportunity requirements of applicable law from the Bureau within the preceding twenty-four months, or an appropriate agency of the State of New York or of the United States within the preceding twelve months, except as the Bureau may direct by regulation."

b. Section 7(c) of such Order is amended to read as follows:

"On-the-job training of economically disadvantaged persons shall be required on all construction contracts covered by the submission requirements of this Order."

Section 2. Effective Date. This Order shall take effect immediately, but shall have no retrospective effect with respect to the two (2) year approval period provided for in Section 1(a) of this Order, amending Section 6(a) (iii) of Executive Order No. 50, dated April 25, 1980.



Edward I. Koch
M A Y O R



JUN 23 1986

THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, N.Y. 10007

Executive Order No. 94
June 20, 1986

Amendment of Executive Order No. 50
(April 25, 1980)

BUREAU OF LABOR SERVICES

By the power vested in me as Mayor of the City of New York, it is hereby ordered:

Section 1. Prior Order Amended.

a. Section 1 of Executive Order No. 50, dated April 25, 1980, is amended to read as follows:

"Purpose. It is the purpose of this Order to ensure equal employment opportunity in City contracting."

b. Section 3(i) of such Order is amended to read as follows:

"equal employment opportunity means the treatment of all employees and applicants for employment without unlawful discrimination as to race, creed, color, national origin, sex, age, disability, marital status or sexual orientation in all employment decisions, including but not limited to recruitment, hiring, compensation, training and apprenticeship, promotion, upgrading, demotion, downgrading, transfer, lay-off and termination, and all other terms and conditions of employment;"

c. Section 5(a) of such Order is amended to read as follows:

"Equal Employment Opportunity. A contracting agency shall include in every

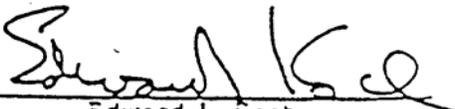
contract to which it becomes a party such provisions requiring the contractor to ensure equal employment opportunity as the Bureau may direct, consistent with this Order."

d. Section 12 of such Order is amended to read as follows:

"Regulations. The Bureau shall promulgate such regulations, subject to the approval of the Mayor, as may be necessary to discharge its responsibilities under this Order, including regulations increasing the dollar amounts and number of employees referred to in this Order. Any regulations of the Bureau establishing terms and conditions for contractors shall be approved as to form by the Corporation Counsel.

Nothing contained herein shall be construed to bar any religious or denominational institution or organization, or any organization operated for charitable or educational purposes, which is operated, supervised or controlled by or in connection with a religious organization, from limiting employment or giving preference to persons of the same religion or denomination or from making such selection as is calculated by such organization to promote the religious principles for which it is established or maintained. The regulations shall set forth this exemption for religiously-sponsored organizations and provide for the discharge of the Bureau's responsibilities in a manner consistent with such exemption."

Section 2. Effective Date. This Order shall take effect immediately.


Edward I. Koch
M A Y O R



NYC Housing Preservation & Development

<http://www.nyc.gov/html/hpd/html/home/home.shtml>

American Institute of Architects, New York Chapter

<http://www.aiany.org/>

New York State Energy Research and Development Authority

<http://www.nyserda.org/default.asp>

Enterprise

<http://www.enterprise.com>

JPMorganChase

<http://www.jpmorganchase.com/cm/cs?pagename=Chase/Href&urlname=jpmc/community/cdg>

The South Bronx

Community Board 1

<http://www.bronxmall.com/commboards/cd1.html>

The Bronx Mall

<http://www.bronxmall.com>

Bronx Overall Economic Development Corporation

<http://www.boedc.com/html/>

New York City Department of City Planning – Profile of the Bronx Community District 1

<http://www.nyc.gov/html/dcp/pdf/lucds/bx1profile.pdf>

Housing in New York City

New Housing Marketplace: Creating Housing for the Next Generation: 2004-2013

<http://www.nyc.gov/html/hpd/downloads/pdf/10yearHMplan.pdf>

NYC Rent Guidelines Board

Housing Research

<http://www.housingnyc.com/html/research/research.html>

2006 Income and Expense Study

http://www.housingnyc.com/downloads/research/pdf_reports/ie06.pdf

Quality Affordable Housing

Design Advisor

<http://www.designadvisor.org/frameset.html?http://www.designadvisor.org/gallery/gallery.html#green>

Affordable Living / Finance

NYC Housing Preservation & Development

<http://www.nyc.gov/html/hpd/html/developers/finance.shtml>

New York City Housing Development Corporation

<http://www.nychdc.com/>

Affordable Housing Corporation

<http://www.ahcinc.org/template.cfm?page=23>

Sustainable Living

Leadership in Energy and Environmental Design (LEED)

<http://www.usgbc.org/LEED/>

New York State Energy Research and Development Authority

<http://www.nyserda.org/default.asp>

ASHRAE

www.ashrae.org

Enterprise Green Communities

<http://www.greencommunitiesonline.org/index.asp>

Enterprise Green Communities Criteria

<http://www.greencommunitiesonline.org/GreenCriteria.pdf>

New York City Department of Design and Construction

<http://www.nyc.gov/html/ddc/html/ddcgreen/>

Building Green / Green Spec

www.buildinggreen.com

Design Trust for Public Space: Sustainable New York City

http://designtrust.org/projects/project_05sustnyc.html

Global Green

<http://www.globalgreen.org>

Healthy Building Network
<http://www.healthybuilding.net>

GreenHomeNYC
<http://www.greenhomenyc.org>

Healthy Living

Fit-City: Promoting Physical Activity Through Design
<http://www.aiany.org/eOCULUS/2006/2006-05-30.html#designerscut>

New York City Department of Health and Mental Hygiene

Take the South Bronx Community Health Survey
<http://www.nyc.gov/html/doh/html/community/community.shtml>

General reports on obesity
http://www.nyc.gov/html/doh/html/cdp/cdp_pan.shtml



Exhibit:

Tab A – Step 1 Completeness Checklist

Tab	Exhibit	For Respondent Use ONLY ✓	For Jury Use ONLY ✓
A	Step 1 Response Completeness Checklist		
B	Respondent Entity Information & Structure		
C	Respondent Entity Principal Questionnaire		
D	Respondent's Letter of Interest		
E	Respondent's Letter of Understanding		
F	Development Experience		
G	Design Portfolio		



Exhibit: Tab B – Respondent Entity Information

1. Respondent Entity Information

Name of Respondent: _____

Address: _____

Contact for Respondent Entity: _____

Address: _____

Telephone: _____

Email: _____

Fax: _____

2. Respondent Entity Principals

Is the Respondent Entity a joint venture? Yes [] No []

If yes, list below each Principal (Individual or Organization) that comprises the Respondent Entity. Include percentage of ownership, address, contact person, telephone, e-mail, and fax numbers.

% Ownership	Respondent Entity Principal
	Principal Name Address Contact Telephone Email Fax
	Principal Name Address Contact Telephone Email Fax
	Principal Name Address Contact Telephone Email Fax

3. Respondent Team

List below each Individual / Organization that comprises the Respondent Team. For each entry, please include the address, contact person, telephone, e-mail, and fax numbers. Respondent Teams must include developers, architects, engineers, LEED-certified environmental consultants, and construction managers or general contractors. The Respondent Team may include other team roles not listed below. Please include all known Team Roles. If unknown, enter "N/A".

Team Role	Individual / Organization	Description of Role
Developer	Name Address Telephone Email Fax	
Architect(s)	Name Address Telephone Email Fax	
Engineer(s)	Name Address Telephone Email Fax	
LEED Certified Environmental Consultant	Name Address Telephone Email Fax	
Construction manager or general contractors	Name Address Telephone Email Fax	
Other	Name Address Telephone Email Fax	
Other	Name Address Telephone Email Fax	
Other	Name Address Telephone Email Fax	



Exhibit: Tab C – Respondent Entity Principal Questionnaire

A separate Respondent Entity Principal Questionnaire must be provided for each Individual and/or Organization that comprises the Respondent Entity.

1. Principal Information

Name of Principal: _____

2. Individual Information

Provide the following information about all Individuals that make up the Principal completing this questionnaire. State the role that each would play in the development of the site, using the categories specified below.

For corporations, provide the names of the officers and any shareholders owning 10% or more. For partnerships, provide the names of all general partners.

Name Position / Title	Home Address	Role *	% Owned	Social Security Number

- * Role categories:
- GP = General/Managing Partner
- GC = General Contractor
- F = Provides Financing, Inactive
- A = Architect
- L = Legal Services
- MR = Marketing Agent, Residential
- MC = Marketing Agent, Commercial/Retail
- O = Other (specify)

3. References

For each of the following categories, provide the name, address, telephone and fax numbers of **at least three** business references that we may contact regarding your experience. For each reference, identify the property or properties with which the individual is familiar.

- New Construction
- Marketing — Residential
- Leasing – Commercial / Retail, Community / Institutional
- Management
- Financial Capacity

4. Other

Has any Individual identified in Section 2 of this questionnaire, or any organization in which the Individual is or was a general partner, corporate officer, or owned more than 10% of the shares of the corporation, been the subject of any of the following:

1. Arson conviction or pending case? Yes [] No []
2. Harassment complaint by the New York State Division of Rent Control or the New York State Division of Housing and Community Renewal? Yes [] No []
3. Had an ownership or management interest in a property that was taken in rem by the City or assigned by a judge of Landlord and Tenant Court to a 7A administrator or receiver? Yes [] No []
4. City mortgage foreclosure or currently more than 90 days in arrears on any City loan? Yes [] No []
5. Default on any contract obligation or agreement of any kind or nature entered into with the City or one of its agencies? Yes [] No []
6. In the past ten (10) years, failed to qualify as a responsible bidder, or refused to enter into a contract after an award has been made, privately or with any government agency? Yes [] No []
7. In the last seven (7) years, filed a bankruptcy petition or been the subject of involuntary bankruptcy proceedings? Yes [] No []
8. In the last ten (10) years, failed to file any required tax returns, or failed to pay any applicable Federal, State of New York, or City taxes or other charges? Yes [] No []
9. Been convicted of fraud, bribery, or grand larceny? Yes [] No []

If the answer to any question is yes, provide the following information about each instance: name of Individual(s); name(s) of organization(s) or corporation(s); Individual's title or role in the organization (e.g. officer); date of the action; and current status and disposition.

Name of Principal: _____

Signature of Individual: _____

Print Name and Title of Individual: _____

5. Certification

[This certification must be signed by one of the Individuals listed above; if the Respondent Entity is a joint venture, an Individual representing each Principal of the joint venture must sign it.]

I certify that the information set forth in this application and all attachments and supporting documentation is true and correct. I understand that the City of New York will rely on the information in or attached to this document and that this document is submitted to induce the City of New York to select this proposal for development of a site.

I understand that this statement is part of a continuing application and that until such time that the subject project is finally and unconditionally approved by the City of New York, I will report any changes in or additions to the information herein, and will furnish such further documentation or information as may be requested by the City of New York or any agency thereof.

I understand that if I receive preliminary designation to develop this site, I must submit all additional disclosure forms required.

Name of Principal: _____

Signature of Individual: _____

Print Name and Title of Individual: _____

Name of Principal: _____

Signature of Individual: _____

Print Name and Title of Individual: _____

Name of Principal: _____

Signature of Individual: _____

Print Name and Title of Individual: _____



Exhibit: Tab D – Respondent Letter of Interest

Provide a general description of the Respondent Team, as well as a summary of the team's past experience as it relates to the vision for this Project (no more than 1 page)



Exhibit: Tab E – Respondent’s Letter

Department of Housing Preservation and Development
Office of Development
100 Gold Street, Room 9G
New York, NY 10038
Attention: Karen Hu

Re: Request for Proposals for NEW HOUSING NEW YORK

Dear Ms. Hu:

This letter is being submitted in connection with my proposal (“Proposal”) submitted in response to the Request for Proposals (“RFP”) issued by the Department of Housing Preservation and Development (“HPD”) of the City of New York (“City”) for New Housing New York, a mixed-use development on Sites 1A and 13 of the Bronxchester Urban Renewal Area in (“Development Site”) in the Bronx.

I have received, read, and understand the provisions of the RFP. I understand that selection of a Respondent (“Respondent”) under the RFP for disposition of a Development Site and the development of the Project described in the RFP (“Project”) will mean only that HPD will commence negotiations with such Respondent regarding the development of the Development Site.

I recognize that any negotiations with HPD will be subject to the following terms and conditions:

1. The commencement of negotiations will not represent any obligation or agreement on the part of the City, which may only be incurred or entered into by a written agreement which has been (i) approved as to form by the City’s Law Department, (ii) approved by the Mayor after a hearing on due notice; and (iii) duly executed by the Respondent and the City. The Negotiation Letter will only indicate HPD’s intention to commence negotiations, which may ultimately lead to the execution of such an agreement.
2. The Respondent will not have permission to enter upon the Development Site, which permission will only be granted, if at all, in the form of a license agreement duly executed by the Respondent and the City. The execution of any such license agreement, if it occurs, will only indicate that the City has granted permission for the Respondent to enter onto the Development Site for the limited purposes stated in the scope of work set forth therein, and will not indicate that the City reached any other agreement with the Respondent regarding the Development Site or the Project.
3. The following requirements will have to be satisfied prior to the disposition of the Development Site:

The disposition of the Development Site and tax exemptions to be granted, if any, must be reviewed and approved in accordance with all applicable HPD and City policies, which include, but are not limited to, the following:

- a. The Respondent, any other potential grantee of the Development Site, and their respective principals must successfully undergo a background check concerning their suitability to do business with the City.
 - b. The Development Site will not be sold to any person or entity which, or to any entity with a principal who: (i) has not fulfilled development responsibilities undertaken in connection with the City or other governmental entities, (ii) is in default on any obligations to the City, (iii) is a former owner of the Development Site, or (iv) has lost real property to the City in tax or lien enforcement proceedings.
 - c. The price and other terms for the disposition of the Development Site and the tax exemption to be provided, if any, will be consistent with applicable City policies.
 - d. The grantee must execute legal documents in form and substance acceptable to HPD and in form approved by the City's Law Department.
4. During negotiations, the Respondent must diligently, competently, and expeditiously comply with all requirements communicated to the Respondent by HPD.
 5. The design of the Project must comply with any applicable Urban Renewal Plan and HPD development guidelines.
 6. Either HPD or the Respondent may terminate negotiations at any time with or without cause. Negotiations will be terminated if Respondent does not commence construction within eighteen (18) months from the date of the Negotiation Letter.
 7. If negotiations are terminated by either HPD or the Respondent, whether with or without cause, or if negotiations terminate automatically, then neither the City nor the Respondent will have any rights against or liabilities to the other.
 8. The City is not obligated to pay, nor will it in fact pay, any costs or losses incurred by the Respondent at any time, including, but not limited to, the cost of: (i) any prior actions by the Respondent in order to respond to any selection process, or (ii) any future actions by the Respondent in connection with the negotiations, including, but not limited to, actions to comply with requirements of HPD, the City, or any applicable laws.

Very truly yours,

Signature

Title

Respondent



Exhibit: Tab F – Development Experience

Provide information on five (5) projects executed within the last ten (10) years, including one completed project of similar scale. The developer must have comparable experience in New York City. A detailed description of any innovative financing models used may be added. No more than three pages.



Exhibit:

Tab G – Design Portfolio

Provide a portfolio of relevant projects executed within the last ten (10) years, including one completed project of similar scale. Projects must represent work by both the developer and architect, though not necessarily as collaborative efforts. For each project, include the following: (1) the name of the lead designer, (2) plans, elevations, sections and site plans for each project, (3) three dimensional exterior images or other drawings and photos, as desired; and (4) a brief written description highlighting the salient characteristics of the project, including the design and/or development philosophy and financing approach (if applicable) and a description of what was innovative about the design. List any design citations or awards, and entries to design competitions. Present each project on up to three (3) sheets, including all text. Format may be either landscape or portrait, but not both; sheets may be either 8.5x11 inches or 11x17 inches. The portfolio must be no more than 15 pages total.



Exhibit: Tab H – Step 2 Completeness Checklist

Tab	Exhibit	For Respondent Use ONLY ✓	For Jury Use ONLY ✓
H	Step 2 Response Completeness Checklist		
I	Project Narrative & Design Documents		
	1. Site Design and Planning		
	2. Design / Architectural Documents		
J	Sustainability Narrative		
	1. LEED Checklist		
	2. NYSERDA Energy Star Simulation Guidelines		
K	Project Financing		
	1. Condo / Co-op Project Income & Affordability		
	2. Rental Project Income & Affordability		
	3. Purchase Price and Affordability Calculations		
	4. Rent and Affordability Calculations		
	5. Construction Period Uses of Funds		
	6. Construction Financing Sources		
	7. Permanent Financing Sources		
	8. Condo / Co-op Pro Forma Income and Expense Schedule		
	9. Rental Pro Forma Income and Expense Schedule		
L	Assets Statement		
M	Project Development Schedule		



Exhibit: Tab I – Project Narrative and Design Documents

Site Design and Planning

Provide a written description of the Proposal, describing salient characteristics of the design from an urbanistic and architectonic perspective, and the use of materials and systems for the proposed design. The narrative should convey the Finalist Team's vision, passion, and commitment to this Project. Creating designs that are in full compliance with Current Building Code and Zoning Resolution can sometimes inhibit creative solutions. Modifications to either regulation that would allow for a better solution are acceptable and welcomed. A description of the issue(s) that the Finalist Team wants to change and how life safety will be maintained should be included in the Proposal. Narrative should be limited to two (2) pages. The LEED checklist (11.0 Exhibits Tab J) should be used to describe the green building features proposed. An additional description of how the Proposal complies with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines can be included if deemed necessary.

Required Design/Architectural Documents:

Drawings

All drawings must be formatted on 11" X 17" paper. The required drawings are intended to communicate both technical information and the design concept and an experiential sense of the finished scheme.

Plans

- Site Plan at 1 inch = 100 feet
- First Floor Plan showing commercial/ community space and residential lobby at 1/32" = 1'-0"
- Typical Building Floor Plan at 1/32" = 1'-0"
- Typical Unit Plans at 1/8" = 1'-0"
- Typical Unit Plans at 1/8" = 1'-0" showing furniture layouts

Elevations

- All four Street Elevations at 1/32" = 1'-0"

Sections

- One cross section at 1/32" = 1'-0"
- One longitudinal section at 1/32" = 1'-0"

Perspectives

A minimum of two (2) perspective renderings demonstrating a pedestrian's view of the building. One view must show the primary residential entry (or entries if proposing separate buildings).

Display Boards:

All Finalist Teams are required to submit their Proposals on only two (2) 30-inch x 40-inch mounted boards with the 40-inch side oriented vertically (portrait format). Lightweight foam core board is preferred for mounting. The boards should have a maximum thickness of three-eighths of an inch (3/8"). The back and the front of the display boards must be free of any projections that might damage other entries when the boards are stored or transported.

The display boards must include a site plan, and any other drawings of the Finalist Team's choice that clearly demonstrate the proposed design concept.



Exhibit: Tab J – Sustainability

The Legacy Project challenges Respondents to integrate sustainable design and protection of the environment into every phase of the Project. From predevelopment through project completion, the potential impacts of everyday practices and activities on ecology, health, and quality of life should be minimized.

To this end, meeting or exceeding the Leadership in Energy and Environmental Design (LEED) Silver rating for the built portion of the project is required. Complying with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines is also required. Proposals that can achieve this goal with no or minimal initial capital costs and the greatest projected savings in long-term operating and maintenance costs will be given preference.

Please provide a written narrative (no longer than 2 pages) to describe how this Proposal meets the sustainability requirements. Use the LEED checklist to itemize the proposed sustainability features. An additional description of how the Proposal complies with the NYSERDA Multifamily High-Rise ENERGY STAR Simulation Guidelines can be included if deemed necessary.

<<<<Proposal Name>>>>

New Housing New York Exhibit Tab J

<<<<Finalist Team Name>>>>

LEED	Description	Possible Points	Points Achieved	Please provide a short description of how the proposal meets the qualification	(For Jury use only) Checklist
SUSTAINABLE SITES		14			
Prerequisite 1	Construction Activity Pollution Prevention	Req.	0		
Credit 1	Site Selection	1			
Credit 2	Development Density & Community Connectivity	1			
Credit 3	Brownfield Redevelopment	1			
Credit 4.1	Alternative Transportation, Public Transportation Access	1			
Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1			
Credit 4.3	Alternative Transportation, Low Emitting & Fuel Efficient Vehicles	1			
Credit 4.4	Alternative Transportation, Parking Capacity	1			
Credit 5.1	Site Development, Protect or Restore Habitat	1			
Credit 5.2	Site Development, Maximize Open Space	1			
Credit 6.1	Stormwater Design, Quantity Control	1			
Credit 6.2	Stormwater Design, Quality Control	1			
Credit 7.1	Heat Island Effect, Non-Roof	1			
Credit 7.2	Heat Island Effect, Roof	1			
Credit 8	Light Pollution Reduction	1			
		Subtotal	0		

<<<<Finalist Team Name>>>>

LEED	Description	Possible Points	Points Achieved	Please provide a short description of how the proposal meets the qualification	(For Jury use only) Checklist
WATER EFFICIENCY		5			
Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1			
Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1			
Credit 2	Innovative Wastewater Technologies	1			
Credit 3.1	Water Use Reduction, 20% Reduction	1			
Credit 3.2	Water Use Reduction, 30% Reduction	1			
	Subtotal		0		
ENERGY & ATMOSPHERE		17			
Prerequisite 1	Fundamental Commissioning of the Building Energy Systems	Req.	0		
Prerequisite 2	Minimum Energy Performance	Req.	0		
Prerequisite 3	Fundamental Refrigerant Management	Req.	0		
Credit 1	Optimize Energy Performance	1-10			
Credit 2	On-Site Renewable Energy	1-3			
Credit 3	Enhanced Commissioning	1			
Credit 4	Enhanced Refrigerant Management	1			
Credit 5	Measurement and Verification	1			
Credit 6	Green Power	1			
	Subtotal		0		

<<<<Finalist Team Name>>>>

LEED	Description	Possible Points	Points Achieved	Please provide a short description of how the proposal meets the qualification	(For Jury use only) Checklist
MATERIALS & RESOURCES		13			
Prerequisite 1	Storage & Collection of Recyclables	Req.	0		
Credit 1.1	Building Reuse, Maintain 75% of Existing Walls, Floors & Roof	1			
Credit 1.2	Building Reuse, Maintain 95% of Existing Walls, Floors & Roof	1			
Credit 1.3	Building Reuse, Maintain 50% of Interior Non-Structural Elements	1			
Credit 2.1	Construction Waste Management, Divert 50% from Disposal	1			
Credit 2.2	Construction Waste Management, Divert 75% from Disposal	1			
Credit 3.1	Materials Reuse, 5%	1			
Credit 3.2	Materials Reuse, 10%	1			
Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1			
Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1			
Credit 5.1	Regional Materials, 10% Extracted, Processed & Manufactured Regionally	1			
Credit 5.2	Regional Materials, 20% Extracted, Processed & Manufactured Regionally	1			
Credit 6	Rapidly Renewable Materials	1			
Credit 7	Certified Wood	1			
		Subtotal	0		

<<<<Finalist Team Name>>>>

LEED	Description	Possible Points	Points Achieved	Please provide a short description of how the proposal meets the qualification	(For Jury use only) Checklist
INDOOR ENVIRONMENT QUALITY		15			
Prerequisite 1	Minimum IAQ Performance	Req.	0		
Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	Req.	0		
Credit 1	Outdoor Air Delivery Monitoring	1			
Credit 2	Increase Ventilation	1			
Credit 3.1	Construction IAQ Management Plan, During Construction	1			
Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1			
Credit 4.1	Low-Emitting Materials: Adhesives & Sealants	1			
Credit 4.2	Low-Emitting Materials: Paints & Coatings	1			
Credit 4.3	Low-Emitting Materials: Carpet Systems	1			
Credit 4.4	Low-Emitting Materials: Composite Wood & Agrifiber Products	1			
Credit 5	Indoor Chemical and Pollutant Source Control	1			
Credit 6.1	Controllability of Systems, Lighting	1			
Credit 6.2	Controllability of Systems, Thermal Control	1			
Credit 7.1	Thermal Comfort, Design	1			
Credit 7.2	Thermal Comfort, Verification	1			
Credit 8.1	Daylight and Views, Daylight 75% of Spaces	1			
Credit 8.2	Daylight and Views, Views for 90% of Spaces	1			
		Subtotal	0		

<<<<Finalist Team Name>>>>

LEED	Description	Possible Points	Points Achieved	Please provide a short description of how the proposal meets the qualification	(For Jury use only) Checklist
INNOVATION & DESIGN PROCESS		5			
Credit 1.1	Innovation in Design	1			
Credit 1.2	Innovation in Design	1			
Credit 1.3	Innovation in Design	1			
Credit 1.4	Innovation in Design	1			
Credit 2	LEED Accredited Professional	1			
		Subtotal	0		
			0	TOTAL QUALIFIED LEED CREDITS	



ENERGY STAR[®]
MULTIFAMILY PILOT PROGRAM

Simulation Guidelines

Version 2.1
March 3, 2006

Prepared by:
Taitem Engineering, PC, 109 South Albany Street, Ithaca, New York 14850

Phone: (607)-277-1118, www.taitem.com

Table of Contents

I.	SCOPE.....	102
II.	OBJECTIVES	102
III.	BUILDINGS WITHIN THE SCOPE OF ASHRAE 90.1	102
1.	General Approach	102
2.	Modifications to Appendix G Performance Rating Method	103
2.1	Performance Rating and Documentation Requirements (Sections G1.2 and G1.4)	103
2.2	Simulation Program (Section G2.1)	105
2.3	Design Model (Table G3.1.1).....	106
2.4	Schedules (Table G3.1, Section 4)	107
2.5	Building envelope: Opaque assemblies (Table G3.1, Section 5).....	109
2.6	Building envelope: Vertical Fenestration (Table G3.1 Section 5).....	111
2.7	Lighting (Table G3.1 Section 6).....	112
2.8	Thermal Blocks (Table G3.1 Sections 7, 8 and 9).....	115
2.9	HVAC.....	116
2.10	Service Hot Water Systems (Table G3.1 Section 11).....	116
2.10.1	Equipment Type and Efficiency	116
2.10.2	Hot Water Demand.....	117
2.10.3	Hot Water Distribution System - TBD	119
2.11	Receptacles and other plug loads (Section G 3.1.12)	119
2.12	Elevator Loads.....	124
2.13	Minimum outdoor ventilation and infiltration	124
2.14	HVAC Distribution Losses.....	126
2.15	Energy Rates.....	128
IV.	PERFORMANCE RATING METHOD FOR LOW-RISE RESIDENTIAL BUILDINGS...	128
V.	APPENDIX A.....	130

I. SCOPE

This document contains the methodology for calculating a performance rating for high-rise and low-rise multifamily buildings in the NYSERDA ENERGY STAR[®] Multifamily Pilot (EMP). The document is to be used by Energy Consultants to calculate a performance rating of the proposed design. It may be shared with the property owner if requested.

II. OBJECTIVES

1. For buildings in the scope of ASHRAE 90.1:

- a) Develop a simulation methodology based on ASHRAE Standard 90.1-2004 Appendix G (“Appendix G”) to evaluate energy efficiency of high-rise multifamily buildings.
- b) Identify and develop a consistent approach for handling components that are not included in Appendix G, or included without the level of detail needed to support the simulation process.
- c) Recommend an approach for handling the issues that Appendix G leaves for the “rating authority” to decide. The “rating authority” is NYSERDA for this pilot.

2. For low-rise residential buildings:

- a) Select a performance rating method and simulation methodology for low-rise buildings.

3. For all buildings:

- a) Ensure that the rating process facilitates energy efficient design from the beginning of the design process.
- b) Avoid unnecessarily complex/detailed simulation requirements to ensure an optimal combination of calculation accuracy and modeling effort and to simplify quality assurance.
- c) Ensure that the simulation process adequately supports EMP reporting requirements.
- d) Ensure that the proposed design simulation produces a reasonable estimate of anticipated actual energy consumption of the building. However, as indicated in Section G1.2 of Appendix G, the performance rating models are not predictions of the actual energy consumption.
- e) Ensure that rating method does not penalize good initial design.

III. BUILDINGS WITHIN THE SCOPE OF ASHRAE 90.1

1. General Approach

Background (Informative)

A comparison of national standards (ASHRAE Standard 90.1, ASHRAE Standard 62.1, etc.) to state and local codes (Energy Conservation Construction Code of New York State (ECCC NYS), NYC Building Code, etc.) uncovered differences between national and local requirements.

For example, the ASHRAE 90.1 minimum surface R-value requirements differ from requirements outlined in Section E802.2 of ECCC NYS. The required envelope parameters in both documents depend on climate zone, but NYS is covered by three climate zones in ASHRAE 90.1 and by seven climate zones in ECCC NYS.

Ventilation requirements are another example of differences between national and local requirements. ASHRAE Standard 62.1 calls for fixed ventilation air flow for residential kitchens (100 CFM intermittent or 25 CFM continuous per kitchen). The New York City Building Code on the other hand requires that the ventilation rate be proportional to the kitchen area (2 CFM/SF).

ASHRAE Standard 90.1 Section 6.5.6.1 requires heat recovery for certain ventilation systems. There is no such requirement in the ECCC NYS.

Energy Star is a national label. It is important that the energy rating calculated in the NYSERDA Pilot be consistent with national methodologies. In order to achieve this, the components in the baseline building should comply with applicable national standards.

Pilot Requirements

Baseline design components

Components in the baseline building shall comply with ASHRAE Standard 90.1-2004 and other applicable national standards. The most current version of each standard as of 2004 shall be used.

End uses that do not exist in the proposed building can not be included in the baseline simulation. For example, if the parking lot in the proposed design is not lighted, then parking lot lighting power allowance can not be added to the baseline energy consumption.

Proposed design components

Components in the proposed design simulation must reflect the actual building components, except where otherwise specified in this document. Components in the proposed design must comply with the Minimum Performance Standards of the EMP Program as well as applicable state and local codes.

If components are not installed during construction, but are required in lease or sales agreement (for example appliances or room air conditioners), then such components may be modeled in the proposed design, contributing to the performance rating, subject to review and approval of lease/sales agreement requirement by NYSERDA.

Simulation Methodology

- 1) The baseline and proposed design of buildings in the scope of ASHRAE Standard 90.1 shall be simulated per ASHRAE Standard 90.1 Appendix G and as described in this document.
- 2) Baseline and proposed design models shall include only residential and residential-associated spaces in the building. Residential associated spaces are: corridors; stairs; lobbies; rooms used for laundry, exercise, residential recreation, or otherwise used exclusively by residents, building staff, and their guests, and; offices used by building management, administration or maintenance. All other spaces, such as commercial and retail spaces, shall not be included in the simulations or any other aspect of the EMP Program
- 3) Separate baseline and proposed design models shall be created for each non-identical building in the project. Performance rating shall be calculated individually for each such building.
- 4) In some instances, the Simulation Guidelines may include values that do not apply to the input structure of your simulation tool. When this occurs, either use approximate method suggested in the User Manual for your tool, or disregard the non-applicable inputs. Such inputs are included for the programs that may need them.

2. Modifications to Appendix G Performance Rating Method

2.1 Performance Rating and Documentation Requirements (Sections G1.2 and G1.4)

Background (Informative)

Section G1.2 of Appendix G suggests calculating percentage improvement as follows:

Percentage improvement = $100 * (\text{Baseline building performance} - \text{Proposed building performance}) / (\text{Baseline building performance})$

Section G1.4 (a) states that baseline and proposed building performance are calculated by a simulation program.

A survey of existing modeling tools indicated that simulation programs cannot handle a variety of improvements and processes in the building. This is recognized by Section G2.5, which allows the rating authority to adopt an exceptional calculation method to demonstrate above-standard performance. There is a need to develop a consistent way to incorporate the results of these calculations into the percentage improvement equation.

Pilot Requirements

Proposed and baseline building performance must each be calculated as the sum of energy cost by end use. The energy consumption for each end use shall be taken from the report generated by the simulation program as described in Section G1.4 of Appendix G and in this document.

Calculations done outside of the approved modeling tool and not described in this document shall be submitted for approval to the Quality Assurance Consultant.

End-use energy cost used in the Percentage Improvement equation shall be adjusted to incorporate the results of approved calculations done outside of the modeling tool and as described in this document.

Modeling assumptions that are not explicitly specified in Appendix G or this document shall be documented and submitted to Quality Assurance Consultant for approval.

A summary of performance calculation requirements are listed below.

1. Calculate Performance Rating as: $100 * (\text{Baseline Building Performance} - \text{Proposed Design Building Performance}) / (\text{Baseline Building Performance})$.
2. *Baseline Building Performance* shall be determined as follows:
 - a. Export into a spreadsheet file all total electricity & fuel usages from the simulation software, for each of the four Baseline simulations (actual orientation, and 90, 180, 270 degrees, per Table G3.1 of Appendix G).
 - b. Show usage of each fuel according to at least the following components: lights, internal equipment loads such as appliances and plug loads, service hot water heating equipment, space heating equipment, space cooling equipment, fans and other HVAC equipment (e.g. pumps), and otherwise meet the requirements of Section G1.4 of Appendix G.
 - c. Average the results of the four building orientations, for each fuel and per each usage component.
 - d. Multiply cooling electric usage by appropriate adjustment coefficient, per Section 2.3 of these Guidelines.
 - e. Divide the space heating usage by the appropriate distribution loss coefficient as shown in section 2.14 of these Guidelines.
 - f. Subtract electricity usage associated with the Baseline “Default” interior lighting Watts shown in ‘Table 3’ of the ‘EMP Simulation V2.1.xls’ spreadsheet, per Table G3.1 of Appendix G.
 - g. If the energy consumption inputs in steps a-f above was expressed in units other than dollars, then after adjusting the simulation outputs as described above, multiply the result by the appropriate fuel rates. This dollar value (\$) is your *Baseline Building Performance*.
3. *Proposed Design Building Performance* is determined as follows:
 - a. Export into a spreadsheet file all total electric & fuel usages from the simulation software (only the actual building orientation is required; no rotations).
 - b. Show usage of each fuel according to the same end-use components as shown for the Baseline results.
 - c. Multiply cooling electric usage by the same coefficient that is applied to the Baseline cooling electric usage.
 - d. Divide the space heating usage by the same distribution loss coefficient as applied to the Baseline, per section 2.14 of these Guidelines.
 - e. Subtract electricity usage associated with the Proposed Design “Default” interior lighting Watts shown in ‘Table 3’ of the ‘EMP Simulation V2.1.xls’ spreadsheet, per Table G3.1 of Appendix G.
 - f. If the energy consumption inputs in steps a-e above was expressed in units other than dollars, then after adjusting the simulation outputs as described above, multiply the result by the same fuel rates as used for the Baseline simulation. This dollar value (\$) is your *Proposed Design Building Performance*.

2.2 Simulation Program (Section G2.1)

Background (Informative)

Among other requirements, Section G2.1.1 of Appendix G states that the simulation program must have the capability to explicitly model the following:

- (b) hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints and HVAC system operations, defined separately for each day of the week and holidays;
- (e) part-load performance curves for mechanical equipment;
- (g) air-side economizer with integrated control.

The software requirements in Appendix G are designed to cover all types of high-rise buildings in the United States. EMP only applies to multifamily buildings in New York State. The pilot software requirements should be simplified to include only systems and algorithms applicable to the buildings in the pilot. This will allow use of simpler software tools, reduce modeling effort, and streamline quality assurance.

A. Part Load Penalty

Part load penalty is low for correctly sized modern furnaces and boilers. ‘Residential Equipment Part load Curves for use in DOE-2’ paper by Hugh Henderson concludes that "...sealed combustion systems have ...little to no part load degradation, since they eliminate stack and flue losses."

ASHRAE 90.1 does not provide information on part load efficiency requirements for equipment types that are likely to be used in the buildings in the pilot (see Table 6.8.1).

Appendix G calls for the baseline design to have 25% *oversized heating system* and 15% *oversized cooling system*. This requirement is likely based on the following recommendation from Manual J:

"The total capacity (sensible plus latent) of the cooling equipment should not exceed the total load (sensible plus latent) by more than 15 percent for cooling-only applications and warm-climate heat pump applications; or by more than 25 percent for cold-climate applications." (Manual J. 8th Edition)

There is little to no room for credit that proposed design may receive for reducing the size of the heating system.

Economizers

Economizers are typically installed if the building has high internal gains—this applies to almost no apartment building in New York State. Economizers are mostly (although not exclusively) used in rooftop units installed on single-story buildings. Economizers are also used in central-station air handling units, which are usually part of large applied HVAC systems (for example in office buildings). Such systems are not likely to be present in apartments.

Pilot Requirements

Simulations shall follow Appendix G with the following modifications/exceptions:

1. Section (b) is modified to require that the software support only schedules that are typical for multifamily building stock. Schedules may be user-entered or auto-generated by the approved software tool.
2. The baseline simulation must use the schedules for occupancy, lighting, appliances, and thermostats that are included in this document or approved equivalent.
3. Requirement (e) of Section G2.1 to model part-load performance for mechanical equipment is waived for sealed combustion systems.
4. Requirement (g) for the software to have the capability of modeling economizer is waived.
5. The same calculation methods shall be used to model baseline and final design.
6. Software must pass BESTEST Tier 1 or be tested as described in ASHRAE Standard 140.

2.3 Design Model (Table G3.1.1)

Background (Informative)

Modeling all spaces as heated and cooled.

Paragraph (b) of Table G3.1.1 states: All conditioned spaces in the proposed design shall be simulated as being both heated and cooled even if no heating or cooling system is to be installed.

The majority of the buildings in the pilot have no cooling. Once the apartments in the buildings are rented out, some of the occupants may install room air conditioning (AC) units in the apartments. Experience has shown that the fraction of floor area that is cooled is less than half, usually between 30% and 50%, and in many buildings is even less.

Modeling the entire conditioned space as cooled may produce misleading results and distort the savings-to-investment ratio (SIR) of improvements being evaluated by Energy Consultants.

Modeling part (for example 50%) of the conditioned space as cooled will complicate the model, since every thermal block (zone) required by Appendix G would need to be modeled as two separate zones, one heated only and one heated and cooled.

Modeling components that are not yet designed.

Paragraph (c) of Table G3.1.1.1, as well as several other sections of Appendix G, outlines the approach to modeling components that have not yet been designed. Such provisions do not typically apply to the projects in EMP, since the performance rating is intended to evaluate performance of the final building design.

Baseline model can be completed only after all the decisions that affect the baseline model are made. For example, envelope geometry, hot water heater type, heating fuel, HVAC zones, etc. must be known since these features of the final design affect the way the baseline model is created.

Pilot Requirements

Modeling all spaces as heated and cooled.

Every space that is modeled as cooled in the Baseline simulation shall also be modeled as cooled in the Final Design simulation. Likewise, every space that is modeled as heated in the Baseline simulation shall also be modeled as heated in the Final Design simulation. Non-conditioned spaces shall also match between the Baseline and Final Design simulations.

1. Model the entire living (apartment) space, as well as offices, community rooms and other common spaces other than described in #2 below, as heated and cooled.
2. Do not model cooling in corridors and utility spaces such as mechanical rooms, laundry rooms, etc. unless the spaces are cooled in the proposed design.
3. Multiply the modeled cooling energy usage of the baseline and proposed final designs by a cooling adjustment coefficient to obtain adjusted cooling usage. A cooling adjustment coefficient of 0.4 shall be used unless the actual fraction of living area that will be cooled is greater than 40%. In this case the cooling adjustment coefficient shall be equal to the actual fraction of cooled space.
4. Use the adjusted cooling usage when calculating the Percentage Improvement described in Section G1.2 of Appendix G and modified per this document,
5. Use adjusted cooling usage when calculating the SIR of the proposed design.

Modeling components that are not yet designed.

The Baseline simulation shall be based on the final design of the building, not the initial or preliminary design that was received by Energy Consultant from the design team.

Baseline model can not be completed until all the parameters in the proposed design that affect the baseline model are finalized.

2.4 Schedules (Table G3.1, Section 4)

Background (Informative)

Appendix G requires the use of schedules capable of modeling hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints, and HVAC system operation. The schedules should be typical of the proposed building type as determined by the designer and approved by the rating authority.

The Canadian program C-2000, which was very similar to EMP, confirms the importance of establishing consistent schedule requirements. The program reported the following among the most frequent mistakes in DOE2 models created based on the ASHRAE 90.1 Budget Cost Method:

- Schedules for lighting, equipment, HVAC system, etc. were not modeled as defined in ASHRAE 90.1.
- Space temperatures in some zones were unrealistically high.

Heating/Cooling setpoint schedule

Section C5 of Normative Appendix C of ASHRAE Standard 90.1 mandates the following modeling assumption for building envelope trade-off option:

The thermostat setpoints for residential and nonresidential spaces shall be 70F for heating and 75F for cooling, with night setback temperatures of 55F for heating and 99F for cooling.

ASHRAE Standard 55-192 suggests a heating setpoint of 71F and cooling setpoint of 76F as optimal for human comfort. No setback temperatures are defined.

HERS requires the use of the following assumptions in both the rated and the reference home:

Use temperature control setpoints for heating and cooling of 68F and 78F respectively. Where programmable offsets are available in the rated home, 5F temperature control point offsets with an 11pm to 7am schedule for heating and 9am to 3pm schedule for cooling, and with no offsets assumed for the reference home.

Proposed amendment to HERS reduces setback from 5F to 2F to reflect lower than expected savings from programmable thermostats.

The HERS thermostat settings appear more appropriate for residential buildings.

Occupancy schedule

The *Building America Research Benchmark Definition* by National Renewable Energy Laboratory (NREL) contains information on typical occupancy schedule to be used in the HERS benchmark model. The schedule in the document relies on an assumption of peak occupancy of one person per bedroom.

2001 ASHRAE Fundamentals 28.5 suggests using the following estimates for load sizing: “if number of occupants is not known, assume two people for first bedroom and one person for each additional bedroom.” (from Table 9, Summary of Procedures for Residential Cooling Load Calculations).

The *Building America Research Benchmark Definition* assumptions are used for the pilot since they represent typical annual conditions, not peak conditions used for load sizing.

The average value of peak sensible and latent heat gain from ASHRAE Fundamentals for living area and bedrooms adjusted by the schedule fraction is used to calculate occupant-related heat gains for each hour.

Lighting schedule

It is important to use a consistent lighting schedule to correctly account for interaction of lighting with heating and cooling, as well as to estimate energy savings associated with energy efficient lighting.

Incorporating Lighting and Appliance Energy Consumption into the Home Energy Rating Score – A Pilot Study, by Architectural Energy Corporation quotes survey findings that lamps are lit on average 2.34 hours per day.

The Building America website at http://www.eere.energy.gov/buildings/building_america/docs/lighting_020405.xls contains information on hourly lighting distribution developed by NREL. Worksheet *Ltg L0* contains normalized lighting schedules expressed as hourly fractions of daily total lighting energy, and the DOE2 coding required to implement these schedules in hourly simulations.

Pilot Requirements

The schedules described below or approved equivalent schedules must be used. The same schedules must be used in baseline and proposed design unless explicitly allowed otherwise in Appendix G or this document. Any difference in the schedules must be documented in the final report. The schedule assumptions that differ from the ones specified in Simulation Guidelines shall be documented and submitted for approval.

Heating/cooling thermostat schedules.

Setpoint temperature of 68F and setback temperature of 66F shall be used for heating.
 Setpoint temperature of 78F and setback temperature of 80F shall be used for cooling.
 Baseline model must have setback for both heating and cooling.
 The following hourly schedule shall be used to simulate setback control:

Hour of day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Heating setpoint F	66	66	66	66	66	66	66	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	66
Cooling setpoint F	78	78	78	78	78	78	78	78	78	80	80	80	80	80	80	78	78	78	78	78	78	78	78	78

Occupancy schedule

Number of occupants in thermal zone shall be calculated as follows:
 NumberOfOccupants=N*B

N = fraction of occupants present in a given hour, from the table below.
 B = number of bedrooms in the thermal zone. Use B=1 for studio apartments.

Hour of day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
N	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.9	0.9	0.9	1.0	1.0	1.0

Internal gains from occupants in each thermal zone for both baseline and proposed design shall be calculated as follows:

SensibleOccupantHeatGain=220*N*B

LatentOccupantHeatGain=165*N*B

SensibleOccupantHeatGain [Btu]=sensible occupant heat gain for a given hour

LatentOccupantHeatGain [Btu] = latent occupant heat gain for a given hour

DOE2 users should use occupant heat gain and hourly schedules described above.

TREAT users should enter number of occupants in living spaces (apartments) equal to the number of bedrooms and set space type to ‘Living Quarters’ to model the occupant heat gain.

Lighting Schedule

Exterior lighting:

Baseline exterior lighting must be modeled as lit 12 hours per day. This includes savings due to photosensors, that are required per section 9.4.1.3.

Performance credit can be taken for timers or other controls not required by ASHRAE 90.1-2004 either by reducing modeled LPD or by reducing lighting hours of operation to less than 12 hours/day.

Interior non-apartment lighting:

Baseline lighting in corridors, stairwells and lobbies must be modeled as lit 24 hours per day. Performance credit can be taken in the Proposed Design if automatic control devices are installed in these spaces.

Inside-apartment lighting:

Baseline and Proposed Design lighting inside living units shall be modeled as lit 2.34 hours per day.

No schedule-based performance credits can be claimed for inside apartments.

DOE2 users: Calculate daily lighting load Wh/day as product of lighting power density (calculated as described in the Lighting section of Simulation Guidelines) and daily lighting on time of 2.34 hours. The following schedule expressed as hourly fraction of daily total lighting power shall be used:

hour	1	2	3	4	5	6	7	8	9	10	11	12
fraction	0.008	0.008	0.008	0.008	0.024	0.050	0.056	0.050	0.022	0.015	0.015	0.015

hour	13	14	15	16	17	18	19	20	21	22	23	24
fraction	0.015	0.015	0.015	0.026	0.056	0.078	0.105	0.125	0.127	0.088	0.049	0.020

TREAT users: Enter Watts Per Fixture and Fixture Quantity such that total lighting power [Watts] in the space is equal to the lighting power allowance calculated as described in Lighting section of Simulation Guidelines. Enter lighting usage of 2.34 hours per day.

Hours of operation of baseline lighting fixtures in areas not identified above may be estimated by the EC based on occupancy type of each space, and shall reflect the mandatory control requirements of ASHRAE 90.1 Section 9.4, as modified by the Lighting section (2.7) of these Simulation Guidelines.

The lighting schedule for the proposed design may be adjusted to account for non-mandatory lighting controls as described in the Lighting section (2.7) of these Simulation Guidelines.

2.5 Building envelope: Opaque assemblies (Table G3.1, Section 5)

Background (Informative)

Appendix G states that opaque assemblies used for new buildings or additions shall conform to common, lightweight assembly types and shall match the appropriate assembly maximum U-factors in Tables 5.5-1 through 5.5-8.

The ASHRAE 90.1 User's Manual provides the following details on modeling various uninsulated envelope components:

All uninsulated assemblies shall be explicitly modeled. Examples include projecting balconies, perimeter edges of intermediate floor slabs, and concrete floor beams over parking garages.

...Projecting balconies and perimeter edges of intermediate floor slabs are considered part of the exterior wall area. ...It is acceptable to model them as having the depth of the exterior walls they penetrate. For example, if the wall between the intermediate floor slabs has a total depth of 8", then these assemblies can be modeled as being 8" thick. If the concrete slab that forms the projecting balcony or intermediate floor slab for a particular floor is 9" thick, then this section of the wall would be modeled in the proposed design as a 9" high un-insulated concrete wall that is 8" thick.

For the baseline building, this portion of the exterior wall would be considered a mass wall complying with the prescriptive requirements for the appropriate climate zone.

Pilot Requirements

The properties of the baseline surfaces are summarized in the table below. The requirements are based on required construction for each surface type outlined in Appendix G and detailed surface description from Appendix A.

ASHRAE 90.1 Appendix G Surface type	ASHRAE 90.1 Assembly maximum	Surface description
Roof, insulated entirely above deck	U-0.063	Metal deck, R-15ci
Walls above grade, steel-framed	U-0.064	stucco R-0.08 (exterior layer) 0.625" gypsum board R-0.56 R-13 insulation 0.625" gypsum board R-0.56 (interior layer)
Walls below grade	C-1.140	8" medium weight concrete block 0.5" gypsum board R-0.45
Floors, steel-joint	U-0.038	carpet w/pad R-1.23, 4" concrete R-0.25, metal deck R-0, insulation to match the overall U-value
Slab-on-grade	F-0.73 unheated F-0.95 heated	6" concrete, uninsulated 6" concrete, 24" deep vertical insulation R-7.5
Opaque doors, swinging/non-swinging	U-0.7/0.5	

Note: C-factor does not include air and soil resistance; U-factor includes air film resistance.

If the software does not allow input of perimeter heat loss factor (F-factor), then the slab-on-grade construction that corresponds to the F-factor should be modeled in the way appropriate for the software tool. For example, TREAT users should model the baseline slab as 6" concrete slab-on-grade adjacent to ground.

Components in the proposed design shall be modeled in accordance with their actual properties.

Permanent shading devices (side fins, overhangs, balconies) may be accounted for to calculate energy savings in proposed design (per Appendix G), but shall not be included in the incremental cost of the proposed design.

All un-insulated assemblies (e.g., projecting balconies, perimeter edges of intermediate floor slabs, concrete floor beams over parking garages) shall be separately modeled in the proposed design, per Appendix G Table G3.1, Section 5a. Such assemblies are considered to be a wall, per wall definition in Section 3 of ASHRAE 90.1, and should be modeled in the Baseline model as having U-value required in Table 5-5 for exterior walls.

Doors that are more than one-half glass are considered fenestration, per Section 3 of ASHRAE 90.1, and shall be modeled as such in both baseline and proposed design. Consequently, they are not subject to the requirements for opaque doors outlined in the table above.

Surfaces in un-conditioned spaces for which there are no U-value requirements in ASHRAE 90.1 shall be modeled as having the same U-value in the baseline and proposed design simulations.

2.6 Building envelope: Vertical Fenestration (Table G3.1 Section 5)

Background (Informative)

Fenestration distribution is baseline model.

Appendix G requires that the vertical fenestration areas for new buildings and additions be equal to that in the proposed design or 40% of gross above grade wall area, whichever is smaller, and shall be distributed uniformly in horizontal bands across the four orientations.

Limitation of vertical fenestration area to be not more than 40% encourages reduction of glass area and is useful for energy rating. The requirement to distribute window area uniformly across the four orientations is difficult to implement, especially when combined with the Appendix G requirement to model each living unit as a separate thermal block. The requirement seems redundant because baseline performance is already exposure-neutral since it is calculated as average usage for four exposures (see Section G 3.1.5.a).

Partially glazed doors

The standard requirements related to partially glazed doors are complicated. ASHRAE 90.1 Section 3 contains the following definitions:

fenestration: all areas (including the frames) in the building envelope that let in light, including windows, plastic panels, clerestories, skylights, glass doors that are more than one-half glass, and glass block walls.

vertical fenestration: all fenestration other than skylights. Trombe wall assemblies, where glazing is installed within 12 in. of a mass wall, are considered walls, not fenestration.

fenestration area: total area of the fenestration measured using the rough opening and including the glazing, sash and frame. For doors where the glazed vision area is less than 50% of the door area, the fenestration area is the glazed vision area. For all other doors, the fenestration area is the door area.

door: all operable opening areas (which are not fenestration) in the building envelope, including swinging and roll-up doors, fire doors, and access hatches. Doors that are more than one-half glass are considered fenestration. (See fenestration.)

According to these definitions, doors that are more than one-half glass are viewed as fenestration. Such doors are indeed similar to windows with higher frame fraction. For example, a typical 3'x5' window with aluminum frame has 15 SF gross area, 4.04 SF of which is taken by frame, resulting in 27% frame fraction. NFRC label for doors with glazing, just as for windows, includes overall U-value and SHGC.

Doors with glazing area of 50% or less are not considered to be fenestration and must comply with standard requirements for opaque doors. As a result of that, solar gains through glazed portions of such doors will be ignored. This will likely have minimal impact on results, since this glazing constitutes typically a very small fraction of the building fenestration. The glazed areas of such doors will be included in percent fenestration calculations, to determine the code requirements for the fenestration U-value and SHGC.

Pilot Requirements

1. The requirement to distribute fenestration uniformly in horizontal bands across the four orientations in the baseline model is waived.
2. ASHRAE 90.1 window properties for the baseline model shall be used, as shown below:

	Assembly max U- value, fixed	Assembly max SHGC		Window type
		East, West and South Orientations	North Orientation	
Vertical glazing, 0% to 10% of wall	0.57	0.39 (climate zone 4A) 0.49 (climate zone 5A, 6A)	0.49 (climate zone 4A, 5A) 0.64 (climate zone 6A)	Wood/vinyl frame, double glazing
10.1% to 40.0%	0.57	0.39	0.49	Wood/vinyl frame, double glazing
Skylights –	ASHRAE 90.1 Table 5.5-4 & 5.5-6	ASHRAE 90.1 Table 5.5-4 & 5.5-6		

3. For the proposed design model, the properties of fenestration installed in the proposed design shall be used. These properties must include rated U-value and SHGC shown on NFRC label. NFRC rating reflects the overall performance of the fenestration assembly and includes both frame and glazing of the standard size window.
4. Modeling of partially glazed doors:
 - A. Doors that are more than one-half glass:
 - The entire door area shall be counted as vertical fenestration when calculating percent-of-wall for vertical glazing.
 - The door shall be modeled as single fenestration unit in both baseline and proposed design simulation.
 - The door U-value and SHGC in the baseline model shall be determined based on requirements for vertical fenestration in the table above.
 - In the proposed design simulation, the door U-value and SHGC shall be per NFRC label for the door specified in the final design.
 - B. Doors that have glazing area of 50% or less:
 - Only the glazed portion of the door shall be added to the vertical glazing area when calculating percent of vertical glazing.
 - The entire door shall be modeled as opaque in the baseline design simulation. The door U-value shall be based on the code requirements for the opaque doors.
 - The entire door shall be modeled as opaque in the proposed design simulation. Door U-value shall be per NFRC label.

2.7 Lighting (Table G3.1 Section 6)

Background (Informative)

Lighting Power Density

The requirements of ASHRAE 90.1 for lighting power density of multi-family buildings are ambiguous: Lighting of living units is excluded from the scope of Section 9 of the standard per exception 9.1.1(b); Table 9.5.1 provides the maximum lighting power density for multi-family buildings, but this power density excludes lighting inside apartments; Table 9.6.1 contains lighting power densities for areas such as hotel/motel guest rooms and dormitory living quarters, which can be categorized as living units; Appendix G Table G 3.1 provides guidance for modeling lighting in multifamily buildings.

Appendix G requires that the maximum lighting power density in the baseline design model be determined using building area or space function method described in Section 9 of ASHRAE 90.1.

Table 9.6.1 that uses space-by-space method includes several space types applicable to multi-family buildings, such as lobby (1.3 W/SF), corridor/transition (0.5W/SF), family dining (2.1W/SF), office (1.1W/SF), conference/meeting/multipurpose (1.2W/SF), active storage (0.6 W/SF) and several others. Space types Dormitory-Living Quarters (1.1 W/SF) and Hotel/Motel Guest Rooms (1.1 W/SF) have power densities that are likely similar to multi-family living units.

Table 5-10 of *U.S. Lighting Market Characterization: Volume 1: National Lighting Inventory and Energy Consumption Estimate* by Navigant Consulting gives the value of 2.0W/SF as a typical installed wattage in multifamily buildings. Therefore a 1.1 W/SF power density represents a significant improvement above typical current practice.

Lighting Controls

Table G3.2 of Appendix G lists a lighting power adjustment factor of 10% for programmable timing controls and 15% for occupancy sensors or combination of occupancy sensors and timing controls. Both factors apply to areas less than 5,000 SF that are not lighted for 24 hour a day. For areas greater than 5,000 SF or lighted 24 hours a day, no credit is given for timing controls and 10% credit is given for occupancy sensors.

A paper by Dorene Maniccia et al. (Rensselaer Polytechnic Institute School of Architecture) and Bill Von Neida (EPA Energy Star Buildings Program) 'The effects of changing occupancy sensor timeout setting on energy savings, lamp cycling, and maintenance costs' documented energy cost savings from occupancy sensor, including 39%-50% savings in conference rooms, 28%-38% in offices, and 47%-60% in restrooms.

California Code Change Proposal by Pacific Gas and Electric Company found at http://www.energy.ca.gov/title24/2005standards/archive/documents/2002-07-18_workshop/2002-07-18_BILEVEL_LIGHTING.PDF, suggests 0.25 lighting power adjustment factor for hallways.

These findings are incorporated in the pilot requirements as described below, to provide more realistic value for savings from the lighting controls.

Credit for automatic controls can only be taken for spaces where such control is not required by ASHRAE 90.1.

Pilot Requirements

1. Lighting shall be simulated as described in Table G3.1 of Appendix G, using either building area or space-by-space method. Space-by-space method often produces higher lighting allowance and is recommended if lighting energy savings credit is claimed by the proposed design. If the Building Area method is used, then the Baseline power density of 0.7 W/SF (per Table 9.5.1, for "Multi-Family") shall be used for all non-apartment spaces. If the space-by-space method is use, then the baseline power density in non-apartment spaces should be per Table 9.6.1 of ASHRAE 90.1
2. Lighting inside the apartments is excluded from the scope of the ASHRAE 90.1, per Exceptions to 9.1.1.(b). In both the Baseline and Proposed Design, a lighting power density of 1.1 W/SqFt should be used inside all apartments. This power density shall be used for inside apartments regardless if space-by-space or building area method is used.

In some cases performance credit may be allowed for apartment lighting, if the specified hardwired lighting has a higher Luminous Efficacy and Coefficient of Utilization than the fixtures listed below. These fixtures below form the basis of the ASHRAE 90.1 power density of 1.1 W/SqFt in "Dormitory - Living Quarters" and "Hotel/Guest Rooms."

Linear fluorescent:

Luminous Efficacy (including ballast)= 81.75 lumens per watt,

Coefficient of Utilization (CU)= 0.64 at Room Cavity Ratio (RCR)= 5.

Compact fluorescent indirect wall sconce:

Luminous Efficacy= 58.8 lumens per watt,

Coefficient of Utilization (CU)=0.315 at Room Cavity Ratio (RCR)= 5.

Compact fluorescent, downlight, lensed:

Luminous Efficacy= 58.8 lumens per watt,

Coefficient of Utilization (CU)= 0.294 at Room Cavity Ratio (RCR)= 5.

EC must submit to QA the specification for in-apartment lighting prior to modeling performance credit for in-apartment lighting.

3. In certain cases lighting power allowance may be increased as described in Section 9.6.3. In order to take advantage of this section, the lighting must be in addition to general lighting, and the general lighting must be specified on the drawings.
4. Lighting power trade-offs (per Section 9.5.1 (d) and 9.6.1 (d)) are allowed only between the areas that have hard-wired lighting specified on the proposed design drawing. If lighting is specified only for part of the space, then the ASHRAE90.1 lighting power allowance should be assigned to the remainder of the space (for which the lighting is not specified on the drawings) in both baseline and proposed design simulation. Use Interior Lighting worksheet of the EMP Simulation.xls spreadsheet for interior lighting calculations.
5. The installed lighting power in the proposed design is typically not equal to the total wattage of the bulbs and must be calculated as described in Sections 9.1.3 and 9.1.4 of ASHRAE 90.1.
6. Lighting schedule and daily operating time described in the Schedules section of this document shall be used.
7. Lighting energy savings credit may be claimed only for hardwired lighting fixtures.
8. Exterior lighting that is on the site utility meters, (e.g., pole fixtures for walkways and parking, exterior lighting attached to the building) should be included in the Baseline and Proposed Design Models. Exterior lighting performance credit can be claimed only for the areas for which lighting is specified on the drawings. For example, if parking lot in the proposed design is not lighted, then ASHRAE 90.1 lighting allowance for parking lot lighting can not be simulated in the baseline model and compared with zero lighting in the proposed design model. In this case no parking lot lighting should be modeled in either baseline or proposed design simulation. Use Exterior Lighting tab of the EMP Simulation.xls spreadsheet for exterior lighting calculations.
9. The proposed fixtures used to calculate energy savings for lighting-related measures should be capable of producing the lighting output per requirements of Illuminating Engineering Society Lighting Handbook for the given space type, without exceeding the power density limits outlined in ASHRAE 90.1.
10. Per exception to Section 6 of Table G3.1 of Appendix G, for lighting that is connected via receptacles and is not shown or provided for on building plans, the identical lighting power shall be assumed in the simulation of the proposed and baseline design simulation. These loads must be excluded when calculating the baseline and proposed building performance in Percentage Improvement calculation.
11. See the Schedules section of these Guidelines for requirements for modeling automatic controls on exterior lighting.
12. Automatic lighting controls are a Baseline requirement for all spaces listed in ASHRAE 90.1 Section 9.4.1.2(a), and also any non-apartment space that is not intended for 24-hour use. Performance credit can be claimed in the Proposed Design for installing automatic controls in spaces intended for 24-hour use. Corridors, stairwells and lobbies shall be considered intended for 24-hour use. The EC, with the approval of the Quality Assurance Consultant, may identify other spaces in the Proposed Design that are also intended for 24-hour use, and therefore eligible for

performance credit for installation of automatic controls. See the Schedules section of these Guidelines for more information on interior lighting schedules. The Appendix G Table G3.2, which describes the allowable lighting power adjustments for automatic controls, is replaced with the following table. The following power adjustment percentages should be applied to controls-related performance credits:

Automatic Control Device	Space Type	Power Adjustment Percentage
Occupancy sensor	Hallways/Corridors	25%(1)
	Stairwells	35%
	All other spaces intended for 24 hour use	10%(2)
Occupancy sensor and programmable timing control	All spaces	Same as with occupancy sensor only (2)

- (1) 25% power reduction in Hallways per 2005 Building Energy Efficiency Standards of California Energy Code, Section 146
- (2) Appendix G, Table G3.2.

2.8 Thermal Blocks (Table G3.1 Sections 7, 8 and 9)

Background (Informative)

Appendix G calls for the following procedure to model the thermal blocks (Table G 3.1(7) of Appendix G):

Where HVAC zones are defined on HVAC design drawings, each HVAC zone shall be modeled as a separate thermal block.

Exception: Different HVAC zones may be combined to create a single thermal block or identical thermal blocks to which multipliers are applied, provided that all of the following conditions are met:

- (a) The space use classification is the same throughout the thermal block.
- (b) All HVAC zones in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations vary by less than 45 degrees.
- (c) All of the zones are served by the same HVAC system or by the same kind of HVAC system.

There is an additional requirement for multifamily residential buildings (Table G.3.1(9) of Appendix G):

Residential spaces shall be modeled using at least one thermal block per living unit, except that those units facing the same orientation may be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.

These requirements result in the need to create at least 21 thermal blocks to model a building of even a simple shape. The requirement significantly complicates baseline and proposed design models, and quality assurance.

The case study described in Appendix A of this document shows that detailed modeling has a relatively small effect on performance rating of multi-family buildings in the New York State climate.

Modeling fewer thermal blocks reduces the modeling effort, simplifies quality assurance, and reduces number of input errors.

Pilot Requirements

Waive the requirement (b) of Table G.3.1 Section 7 and Section 9 of the same table in Appendix G. These sections disallow aggregation of apartment units that have different exposure and/or are adjacent to different types of surface (e.g. ceiling and slab).

Keep the rest of the thermal block requirements unchanged. For example, common spaces, utility areas and other non-living areas must be modeled as separate thermal blocks.

2.9 HVAC

Pilot Requirements

The Baseline and proposed design HVAC system shall be modeled per Appendix G. For buildings with the fossil fuel or purchased heating in the proposed design, the Baseline HVAC system type is a packaged terminal air conditioner (PTAC) with a constant volume fan control and a hot water natural draft fossil fuel boiler. If fossil fuel is not available, a packaged terminal heat pump (PTHP) is to be used instead of a boiler.

Section 8 of Table G3.1, which describes modeling methodology for projects with no completed zone design, is not applicable to the pilot buildings, because the performance rating is calculated for the final design for which HVAC zones are known.

Modeling should account for seasonal variations in efficiency wherever possible. In all cases the same modeling method and/or efficiency units should be used in the baseline and proposed model. For example, if thermal efficiency (not AFUE) is entered for the baseline model, then thermal efficiency (not AFUE) should also be entered for the proposed design model.

2.10 Service Hot Water Systems (Table G3.1 Section 11)

2.10.1 Equipment Type and Efficiency

Background (informative)

Minimum efficiency and control requirements for service hot water equipment are described in Section 7 of ASHRAE 90.1. Equipment type and modeling assumptions are described in Service Hot Water Systems section of Table G3.1 of Appendix G.

Pilot Requirements

1. Baseline and proposed system type, capacity and fuel should be the same as in the actual design, except when combination heating/hot water system is used in the final design, in which case the stand-alone system shall be modeled as the baseline. The requirements are as described in Appendix G Table G3.1 Section 11.

2. Baseline system efficiency shall be as requires in Section 7.4.2 of ASHRAE 90.1-2004.

3. Water heater efficiency may be described through different parameters, including thermal efficiency, combustion efficiency, stand-by loss, recovery efficiency, energy ractor, etc. The same efficiency descriptors must be used in baseline and proposed design simulation. If software requires more than one efficiency descriptor (for example Recovery Efficiency and Energy Factor), but only one descriptor is provided in ASHRAE90.1 or manufacturer specifications, then the same algorithm must be used to generate missing efficiency descriptor for both baseline and proposed design simulation. For example, if only the thermal efficiency E_t is given, EF may be calculated as follows:

$$EF = E_t / 100 * 0.9$$

All such conversions must be documented and submitted with the model.

4. Unfired storage tank insulation in the baseline model should be R-12.5, per ASHRAE 90.1 Table 7.8.

2.10.2 Hot Water Demand

Background (informative)

Hot water demand is not covered in ASHRAE 90.1 2004.

Realistic hot water demand inputs in the model are important for the following reasons:

- To ensure that modeling results are more predictive of future building performance
- To allow for better evaluation of cost-effectiveness of energy conservation recommendations related to service hot water.
- To estimate the contribution of hot water heating to the overall building energy cost, which is important for the performance rating.
- To allow performance credit for reducing hot water demand below current federal requirements.

ASHRAE Application Handbook lists the following typical hot water consumption in apartment buildings, referencing several studies conducted between 1991 and 1994:

Number of Apartments	Average Daily Hot Water Demand
20 or less	42.0 gal/apartment
50	40.0 gal/apartment
75	38.0 gal/apartment
100	37.0 gal/apartment
200 or more	35.0 gal/apartment

California Residential ACM calls for fixed hot water consumption of 35 gal/day per apartment for multifamily buildings.

There are two types of hot water load: volume-dominated and flow-dominated.

Filling up the sinks and bathtubs are examples of volume-dominated load. Volume-dominated load is not affected by reduction of fixture flow rate.

The load from showerheads and some faucets is flow-dominated and will be reduced with low flow fixtures. According to a study by Hwang et al. <http://enduse.lbl.gov/Info/LBNL-34046.pdf>, approximately 36% of hot water usage is volume-dominated, 54% is flow-dominated for showers, 10% is flow-dominated for faucets. The same study estimates that the average flow rate of the 1990-1994 stock is 3.40 GPM for both faucet aerators and shower heads.

Federal Energy Policy Act (EPAct) passed in 1992 establishes water efficiency standards for showerheads, and faucets manufactured after January 1994. These requirements are shown in the table below:

Fixture type	EPAct Maximum Flow Rate
Lavatory faucet	2.2 GPM
Kitchen faucet	2.2 GPM
Showerheads	2.5 GPM

The reduction of hot water demand associated with low-flow fixtures that are minimally compliant with EPAct compared to the typical stock of the early 1990s may be calculated as follows:

$$100\% - (36\% + 54\% * LFS/TS + 10\% * LFF/TF) = 17.8\%$$

LFS [GPM] - flow rate of low-flow showerheads; LFS=2.5

TS [GPM] - flow rate of typical showerhead in 1990s; TS=3.4

LFF [GPM] - flow rate of low-flow faucet, LFF=2.2

TF [GPM] - flow rate of typical faucet in 1990s, TF=3.4

17.8% adjustment may be applied to the data published in ASHRAE Applications Handbook to obtain the average daily hot water demand in the new buildings of various sizes. The method yields hot water

demand ranging from 29gal/day-unit to 35 gal/day-unit, depending on the number of apartments in the building.

The volume-dominated water usage may be reduced by installing efficient dishwashers. The EPA Energy Star® dishwasher savings calculator found at http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/CalculatorConsumerDishwasher.xls assumes that hot water consumption of standard non-Energy Star® dishwasher is 1935 gal/year. This value may be used to model hot water demand reduction from Energy Star® dishwashers, as described below.

Water usage of clothes washer is determined by Water Factor, which represents gallons of water used per cubic feet of washer volume in gallons, for each cycle. There is presently no maximum Water Factor required for washers to be Energy Star compliant. However, in the Consortium for Energy Efficiency Residential Clothes Washer Initiative, a minimally compliant residential clothes washer needs to have a Water Factor of 11.0 or lower. Some Energy Star washers do not comply with this Baseline.

The “GallonYr” value in the Proposed Design algorithm is equivalent to the proposed washer’s $V_{cf} * W_F * 392$ (i.e., Volume*WaterFactor*cycles/yr). Since number of cycles and washer volume is unchanged between the baseline and proposed model, the performance credit for reduced water consumption may be based on the Water Factor of the proposed washer as compared to some baseline Water Factor. The baseline Water Factor is set to 11.0.

Pilot Requirements

1. Hot water demand in the baseline simulation shall be calculated as the product of the number of apartments in the building and per-apartment daily usage from the table below:

Number of Apartments	Apartment usage Gal/day-apartment
20 or less	35
21-50	33
51-75	31
76-150	30
151 or more	29

The per-apartment hot water usages above include dishwasher usage. Hot water consumption of clothes washers is not included in the per-apartment usages above, and shall be added to per-apartment usage according to the Clothes Washer Hot Water Usage calculations described below.

2. Hot water demand in the proposed design may be reduced if the installed fixtures have lower flow rate than required by EPA. The adjusted demand may be calculated as follows:

$$\text{ProposedHWDemand[Gal/day]} = \text{BaselineHWDemand} * (0.36 + 0.54 * \text{LFS} / 2.5 + 0.1 * \text{LFF} / 2.2)$$

LFS [GPM] – rated flow rate of the low-flow showerheads specified on the drawings
 LFF[GPM] – rated flow rate of the low-flow faucets specified on the drawings

3. Water savings from Energy Star® dishwashers may be calculated as follows:
 - a. If the water consumption of proposed dishwasher is given as gal/cycle, then multiply it by 215 cycles per year to obtain annual hot water consumption. (The same usage assumption is used in the EPA calculator for the reference dish-washer.) Use this annual hot water consumption in the TREAT proposed design model. In DOE2-based models, convert to the equivalent GPM taking into account the specified load schedule.
 - b. Assume that baseline dishwasher uses 1935 gallons of hot water per year. Enter it in TREAT baseline model. Proceed to the following steps if total hot water usage/savings have to be entered directly in the software tool.

- c. Calculate annual savings by subtracting annual hot water usage of the proposed dishwasher from 1935gal/year for standard dishwasher. If the value is negative, no credit is given.
- d. Divide annual per unit savings calculated in the previous step by 365 and multiply by the number of dishwashers in the building to obtain total daily savings for the building.
- e. Subtract total daily savings from ProposedHWDemand to obtain adjusted daily demand of the proposed design.

4. Clothes Washer Hot Water Usage

Determine hot water usage by each residential clothes washer in baseline and proposed design as follows:

	Baseline Design Hot Water Gal/yr	Proposed Design Hot Water Gal/yr
In-apartment clothes washer	$0.2 * V_{cf} * 11 * 392$	$0.2 * \text{GallonYr}$
Common space clothes washer	$0.2 * V_{cf} * 11 * 392 * N$ $N = \text{MIN}(8, N_{\text{apt}}/N_{\text{washer}})$	$0.2 * \text{GallonYr} * N$ $N = \text{MIN}(8, N_{\text{apt}}/N_{\text{washer}})$

0.2 = estimated ratio of hot water to total water consumed per year.

V_{cf} = Volume (cubic feet) of washer specified in proposed design, as shown at

http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_products_html

11 = Baseline Water Factor. (See “Background” section for explanation).

392 = Number of cycles per year, used in Department of Energy test procedures for residential washers; the assumption is used for in-apartment washers.

GallonYr = the value from “Annual Water Use (gallons/year)” column for the washer specified in proposed design, as shown at

http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_products_html

N_{washer} = Quantity of clothes washers in the Proposed Design.

N_{apt} = Quantity of apartments in the Proposed Design.

8 = Assumes that any washer will not incur more than 3,136 cycles per year ($8 * 392 = 3,136$).

Baseline and Proposed Design hot water consumption for commercial washers that are listed in the Energy Star *commercial* list of clothes washers are TBD

2.10.3 Hot Water Distribution System - TBD

Background

Field study sponsored by NYSERDA showed that piping losses may account for up to 38% of water heating energy in multi-family buildings [Fredric S. Goldner, Home Energy Magazine, <http://hem.dis.anl.gov/eehem/99/991109.html>]

Pilot Requirements

1. The same piping area must be used in the baseline and proposed design models.
2. Hot water setpoint temperature of 120F shall be used in both baseline and proposed design models.

2.11 Receptacles and other plug loads (Section G 3.1.12)

Background

Appendix G requires that receptacle and process loads, such as those for office and other equipment, are estimated based on the building type or space type category and are assumed to be identical in the proposed and baseline building designs, except as authorized by the rating authority.

A consistent appliance load is important in order to estimate energy savings from Energy Star appliances, interactive effects of reduced heat gains on heating and cooling, and for the incremental cost calculations.

Pilot Requirements

Non-lighting receptacle loads shall be included in the Baseline simulation as specified in the following table. All such loads, including the fraction of such loads contributing to internal heat gain, shall be identical in the Baseline simulation and Proposed Design simulation, except where a particular load source is impacted by a specific Energy Conservation Recommendation. Appliances in the baseline design model shall be of the same type and capacity as in the proposed design, unless specified otherwise. For example, the same refrigerator volume shall be used in both models.

Load Source	Baseline Energy Consumption ²	Fraction of Load Contributing to Internal Heat Gain ³	Sensible Load Fraction	Latent Load Fraction	Qty
Refrigerator	1. Go to http://www.energystar.gov/index.cfm?fuseaction=refrig.display_products_html 2. At the above link, obtain the “kWh/yr” value and “Percent Better” data for the refrigerator specified in the Final Design. 3. To determine baseline energy usage, apply the above two values to the following formula: $BkWh/yr = \text{ProposedUsage} / (1 - \text{PercentBetter} / 100)$ ProposedUsage = “kWh/yr” of proposed refrigerator. PercentBetter = “Percent Better” value of proposed refrigerator. BkWh/yr = kWh/yr of baseline refrigerator. 4. If the proposed refrigerator is not found at the above link, then use the value from EnergyGuide label in place of ProposedUsage and PercentBetter=15%. 5. If refrigerator is not specified in proposed design, then assume 480 kWh/yr per apartment in both the baseline and proposed design. (480 kWh/yr is based on the Federal standard for Top Freezer models with an Adjusted Volume of 20.84 CuFt.)	1.00	1.00	0.00	1 per unit

Dishwasher	<p>1. Go to http://www.energystar.gov/index.cfm?fuseaction=dishwash.display_products_html</p> <p>2. At the above link, obtain the “kWh/yr” value and “Percent Better” data for the dishwasher specified in the proposed design.</p> <p>3. To determine baseline energy usage, apply the above two values to the following formula: $BkWh/yr = \text{ProposedUsage} / (1 - \text{PercentBetter} / 100)$ ProposedUsage = “kWh/yr” of proposed dishwasher. PercentBetter = “Percent Better” value of proposed dishwasher. BkWh/yr = kWh/yr of baseline dishwasher.</p> <p>4. If the proposed dishwasher is not included in the above link, then use the value from EnergyGuide label in place of ProposedUsage and PercentBetter=25%.</p>	1.00	0.85	0.15	Same as in proposed
Clothes Washer (5)	<p>1. Go to http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_products_html</p> <p>2. At the above link, obtain the “kWh/yr” value and “Percent Better” data for the clothes washer specified in the proposed design.</p> <p>3. To determine Baseline energy usage, apply the above two values to the following formula: $BkWh/yr = \text{ProposedUsage} / (1 - \text{PercentBetter} / 100)$ ProposedUsage = “kWh/yr” of proposed clothes washer. PercentBetter = “Percent Better” value of proposed clothes washer. BkWh/yr = kWh/yr of baseline clothes washer.</p> <p>4. If the proposed clothes washer is not included in the above link, then use the value from EnergyGuide label in place of ProposedUsage and PercentBetter=35</p> <p>5. For common clothes washers, calculate usage as described above and multiply the result by 8, or by the ratio of Napts/Nwashers, whichever is lesser. Napts = Quantity of Apartments in property. Nwashers = Quantity of clothes washers in proposed design.</p>	1.00	1.00	0.00	Same as in proposed design
Cooking (electric stove/range)	604 kWh/year	0.70	0.40	0.30	Same as in proposed design
Cooking (gas stove/range)	45 Therms/year	0.50	0.30	0.20	Same as in proposed design

Clothes Dryer (electric) (5)	$kWh/yr = 418 + (139 * Nbr)$ Nbr = Number of Bedrooms in living units. For common area clothes dryers, use average number of bedrooms per living unit and multiply the resulting kWh/yr by 8, or by the ratio of Napts/Ndryers, whichever is less. Napts = Quantity of Apartments in property. Ndryers = Quantity of clothes dryers in proposed design.	0.20	0.15	0.05	Same as in proposed design
------------------------------	---	------	------	------	----------------------------

Clothes Dryer (gas) (5)	Total Baseline Energy Consumption = kWh/yr + Therms/yr.	Fraction of kWh Load at Gas Dryer			Same as in proposed design
	kWh/yr = 38 + (12.7*Nbr)	1.00	1.00	0.00	
	Therms/yr = 26.5 + (8.8*Nbr)	Fraction of Gas Load at Gas Dryer			
	Nbr = Number of Bedrooms in living unit. For common area clothes dryers, use average number of bedrooms per living unit and multiply the resulting energy usage by 8, or by the ratio of Napts/Ndryers, whichever is less. Napts = Quantity of Apartments in property. Ndryers = Quantity of clothes dryers in proposed design.	0.15	0.10	0.05	
Miscellaneous Apartment Plug Loads	kWh/yr = FFA*1.37 FFA = Finished Floor Area of living space, in SF.	1.00	0.90	0.10	Same in baseline and proposed design
Miscellaneous Non-Apartment Plug Loads(4)	<u>DOE2</u> : Use load density and schedules specified below: Corridors, restrooms, stairs and support areas: 0.2 W/SF Offices: 1.5 W/SF All Other: 1 W/SF Hourly load fraction: 1am-5am: 10%; 6am:30%, 7am-10am: 45%; 11am-6pm:30%, 7pm: 60%, 8pm: 80%; 9pm: 90%; 10pm: 80%; 11pm: 60%; 12am: 30% <u>TREAT</u> : Calculate load using the following load density: Corridors, restrooms, stairs and support areas: 0.7kWh/SF Offices: 4.9 kWh/SF All Other: 1 kWh/SF	1.00	1	0	Same in baseline and proposed design

Notes to table:

- (1) All "Description" data, except for description of Miscellaneous Apartment Plug Loads, is based on Federal minimum requirements, as described in the *AHAM Guide to the National Appliance Energy Conservation Act*, and/or as described at www.energystar.gov.
- (2) Except for refrigerator, dishwasher and clotheswasher, all "Baseline Energy Consumption" data and "Fraction of Load Contributing to Internal Heat Gain" data (including data on sensible and latent load fractions) is per the End-Use Profiles developed by NREL for the Building America Research Benchmark, DOE Energy Efficiency and Renewable Energy, as made available at http://www.eere.energy.gov/buildings/building_america/pa_resources.html.
- (3) Fraction of Load Contributing to Internal Heat Gain, Sensible Load Fraction, and Latent Load Fraction are expressed as the fraction of the annual Baseline Energy Consumption.
- (4) Non-apartment plug loads are per Table N2-7 of California non-residential ACM.
- (5) Usage of common space washers and dryers: Department of Energy test procedures for residential washers/dryers assume 392 cycles per year. EMP guidelines for common area laundry appliances are based on assumption that this 392 cycles per each appliance will increase by a ratio of number of apartments per appliance, but no more than 3,136 cycles/year per each appliance.

2.12 Elevator Loads

Background (Informative)

Appendix G does not address the savings from energy efficient elevators. Paper by Al-Sharif (October 2004, Elevator World) indicates that elevators typically use 3-5% of the electricity in modern buildings with air conditioning. The percentage would be higher in buildings without air conditioning. There can be a threefold difference in energy consumption between different elevator types, according to research by D.A. Doolard, 1992, as referenced by Al-Sharif. The lighting in the elevator cab offers an additional opportunity to save energy by having the light turn off when the elevator is not in use, and through the use of more efficient lighting. Detailed information on elevator-related savings is presented in a white paper by Harvey M. Sachs, Opportunities for Elevator Energy Efficiency Improvements, sponsored by the American Council for an Energy Efficient Economy (ACEEE).

Pilot Requirements

Use hydraulic elevator in the baseline model for all buildings up to 7 stories high; the geared traction elevator for buildings from 8 to 20 stories; the gearless traction elevator for buildings taller than 20 stories. The energy usage of the elevators for baseline and proposed models can be determined using the Otis Energy Expense Calculator, available online at http://www.otis.com/products/listing/0,1357,CLI23_PRT412_RES1,00.html. Enter your building information into the cells. Energy usage shall be based on 2 runs per day per person; more runs per day can be modeled with documentation of assumptions. The same usage assumptions (e.g number of elevator runs per day, etc.) must be made for both baseline and proposed elevator. 10% of elevator energy usage shall be added to space heat gains. . Savings related to lighting in the cabin may be claimed as performance credit.

2.13 Minimum outdoor ventilation and infiltration

Background (Informative)

ASHRAE 90.1 does not cover infiltration in sufficient detail to support the modeling. The standard provides a verbal description of how a building should be sealed but does not give any references for anticipated leakage areas. The only exception is window and door CFM/SF leakage given in *Section 5.4.3.2*:

Air leakage shall not exceed 1.0 CFM/SF for glazed swinging entrance doors and for revolving doors and 0.4 CFM/SF for all other products.

ASHRAE Standard 90.1 references ASHRAE Standard 62.1 for outdoor air requirements. Appendix G requires that minimum outdoor air ventilation rates are the same for the proposed and baseline building designs.

Infiltration accounts for a significant fraction of heating and cooling energy consumption in multi-family buildings. According to the study *Residential Heating And Cooling Load Component Analysis*, LBL November 1999, infiltration accounts for 39% of heating energy usage of new multi-family buildings in New York City.

ASHRAE Fundamentals states that the effect of infiltration in high-rise buildings is often underestimated. If infiltration airflow rates are normalized by building envelope area instead of by volume, then the envelope air leakage of high-rise buildings is similar to typical low-rise houses.

California non-residential Title 24 requires to model infiltration rate of 0.038 CFM per square foot of gross exterior partition (walls and windows) area for the zone in both baseline and proposed design. Infiltration is not modeled if zone supply air quantity is greater than zone exhaust air quantity. There is no guidance on how to model interaction of mechanical ventilation and infiltration in all other cases.

Modeling infiltration is difficult for the following reasons:

1. Inputs that are required to support detailed algorithms are not available.

ASHRAE Fundamentals 2001 Section 26.20 states:

The air exchange rate of a building may be calculated given (1) the location and leakage function for every opening in the building envelope and between major building zones, (2) the wind pressure coefficients over the building envelope, and (3) any mechanical ventilation airflow rates. These inputs are generally unavailable for all except very simple structures or extremely well studied buildings. Therefore, assumptions as to their values must be made. The appropriateness of these assumptions determines the accuracy of predictions of air exchange rates.

2. The majority of whole-building energy simulation tools have limited capabilities for modeling infiltration.

State-of-the-art review of Whole Building, Building Envelope and HVAC Component and System Simulation and Design Tool Report prepared by AEC and CDH for ARTI provides the following summary of DOE2 capabilities:

Infiltration is modeled using a number of different approaches, including constant air change per hour, which can be scheduled according to the operation of the HVAC system, and the Sherman-Grimsrud infiltration model that takes wind and stack driven infiltration into account. Interzonal ventilation flow is not considered.

This last limitation is very significant for the high-rise buildings in the pilot, since it does not allow effective modeling of the stack effect. As *ASHRAE Fundamentals 2001 Section 26.24* states: In large buildings, the air leakage associated with internal partitions becomes very important.

3. The complexity of calculations further increases due to the presence of mechanical ventilation in the multi-family buildings and its interaction with infiltration.

Pilot Requirements

Baseline design

- a. Baseline design infiltration rate shall be 0.35 ACH and not less than 15 CFM per person. For calculating air changes per hour the volume of the living spaces shall include all areas within the conditioned space, as required in ASHRAE Standard 62.
- b. Continuous mechanical ventilation exhaust rate in each thermal zone representing apartment spaces shall be as specified on drawings but not less than the rate required by ASHRAE Standard 62, quoted below:
Exhaust CFM= $K*25+T*20$
K=number of residential kitchens
T=number of residential toilets
- c. Continuous ventilation make-up in the corridors shall be per ventilation specified on the drawings, but not less than 0.06 CFM/SF [ASHRAE 62.1 Table 6.1]
- d. Mechanical ventilation of other spaces shall be as specified on drawings or per ASHRAE 62, whichever is greater. Heat recovery shall be per ASHRAE Standard 90.1.

Proposed design

Credit for air-tightening the building may be taken only if the proposed design has a heat recovery ventilation system.

The same ventilation rate should be used in the proposed design model as in the baseline model, per section G3.1.2.5 of Appendix G.

Schedules may be allowed to differ between proposed design and baseline building design when necessary to model nonstandard efficiency measures, provided that the revised schedules have the approval of the

rating authority. Measures that may warrant use of different schedules include demand control ventilation, as described in Appendix G.

Modeling method

If the modeling tool is capable of accounting for interaction between infiltration and mechanical ventilation, then separate infiltration and mechanical ventilation inputs shall be used for proposed and baseline models.

If the modeling tool is not capable of accounting for interaction between mechanical ventilation and infiltration, then the equivalent ventilation/infiltration rate shall be calculated using the algorithm described in ASHRAE Fundamentals 2001 p.26.24 as follows:

$$Q_{adj} = Q_{bal} + \text{SquareRoot}(Q_{unbal}^2 + Q_{inf}^2)$$

Q_{adj} [CFM] = equivalent combined rate adjusted for recovery efficiency to be used as infiltration input in the modeling tool instead of separate infiltration and mechanical ventilation inputs if infiltration/ventilation credit is claimed.

Q_{bal} [CFM] = balanced mechanical ventilation flow

Q_{unbal} [CFM] = unbalanced mechanical ventilation flow

Q_{inf} [CFM] = actual infiltration rate to be verified by field measurements

The calculation procedure is demonstrated on *Infiltration And Ventilation* page of the EMP Simulation.xls spreadsheet.

2.14 HVAC Distribution Losses

Background (Informative)

Appendix G does not provide details on how distribution systems should be modeled, other than the statement in Section G3.1.3.6 that piping losses shall not be modeled in either the proposed or baseline building designs for hot water, chilled water, or steam piping.

Not modeling piping losses creates the following problems:

1. Ignoring piping losses is equivalent to assuming 100% distribution efficiency of the hydronic system. As a result, if forced air system distribution losses are modeled and the forced air system is compared to the hydronic system, the modeling results will be misleading because of unequal modeling assumptions.
2. There are no means to get credit for distribution-related improvements.

The issue is complicated by the limited capability of modeling tools to estimate distribution losses.

Air Distribution Systems, Codes and Standards Enhancement (CASE) Study, PG&E, November 28, 2000
<http://www.newbuildings.org/downloads/codes/AirDistribution.pdf> states:

DOE2.1E needs to be significantly enhanced for duct efficiency modeling. Currently, there are considerable problems with the algorithms, and the keywords are complex, difficult to use, and highly sensitive to error. Algorithm problems include:

- All leakage occurs on the supply side of the system
- All losses go to a single zone
- Only one system can have losses to a given zone
- Building and zone infiltration is not sensitive to duct leakage.

State of the Art Software Review provides the following summary of DOE2 capabilities:

DOE 2.1 calculates distribution losses as a function of the total system capacity. This value is held constant throughout the simulation. The energy gain or loss from the duct system is not added or subtracted from any zone, and is therefore 'lost'. Supply side losses are only considered.

DOE 2.2 allows the specification of a duct air loss and a duct conductance. Duct losses/gains are added to a plenum or zone containing the ducts, affecting the duct zone temperature and magnitude of the duct losses. Duct losses to the plenum affect the return air temperature in plenum return systems. The duct loss calculations are applied to the supply duct only.

EnergyPlus allows users to model air distribution loss for a single constant volume HVAC system per building and calculates both supply and return duct losses. However, interaction between mechanical ventilation and infiltration is not accounted for – the infiltration is not modeled (assumed to be 0) whenever HVAC fans are operating.

Neither DOE2 nor *EnergyPlus* can model piping losses. There are plans to include this capability in future versions of *Energy Plus*.

TREAT accounts for both forced air and hydronic distribution losses.

Home Energy Rating Standard recommends fixed distribution efficiency values to be used in the baseline model. The efficiency values are for the system that is fully compliant with ASHRAE 90.1. Forced air distribution system efficiency is based on the assumption that the system is *substantially leak free* as defined by the 1998 IECC to be a leakage rate of not more than 5% of the rated fan flow rate at a pressure differential of 25 Pascal across the entire system, including the manufacturer's air handler enclosure.

Pilot requirements

1. Do not model either piping or duct losses.
2. Account for distribution efficiency using one of the two methods presented below. The same method must be used for baseline and proposed design models.
 - a. Obtain distribution efficiency from the table below depending on distribution system type and location. Divide the heating usage in the proposed and baseline design simulation by the distribution efficiency to obtain total heating energy. Percent Improvement calculations shall be based on these adjusted usages. This method does not allow any credit for distribution-related improvements.

Distribution System Configuration and Condition	Forced Air Systems		Hydronic Systems	
	Heating	Cooling	Heating	Cooling
Distribution system components located in unconditioned space	0.95	0.95	0.95	0.95
Entire distribution system located in conditioned space	1.0	1.0	1.0	1.0
Ductless system	1.0	1.0		

- b. Use ASHRAE 152 Spreadsheets provided by Lawrence Berkeley National Laboratory available at http://www.eere.energy.gov/buildings/building_america/docs/152faip2003_prc2.xls or alternative calculation procedure if distribution-related performance credit is claimed. Provide references and documentation justifying the method.

2.15 Energy Rates

Background (informative)

Section G2.4 of Appendix G suggests using ‘either actual rates for purchased energy or state average energy prices published by DOE’s Energy Information Administration’.

The studies documented in Appendix B indicate that the impact of monthly fluctuation of actual fuel cost on performance rating is significant. To allow for fair comparison of performance rating of different projects on EMP, this influence should be minimized.

Pilot Requirements

1. Performance Rating Calculations.

The following average annual prices must be used for performance rating calculations of all projects in the pilot:

Electricity: 0.1518 \$/kWh
 Natural gas: 1.4944 \$/therm
 Oil: 2.1985 \$/gallon

Alternatively, Energy Consultant may use the most recent annual average price from the local utility company, according to the rate class that will most likely be assigned to the property. In this case the supporting documentation must be provided showing monthly fuel costs for 12 consecutive months.

Actual current fuel rate structure and pricing may be used only if savings associated with demand reduction are modeled.

Performance credit for the reduced energy cost may be claimed only if the cost reduction is due to the reduced energy consumption or demand. Following this rule, savings associated with sub-metering shall not be included in the performance rating.

2. SIR calculations.

The same prices that were used in performance rating calculations may also be used to calculate package SIR. Alternatively, EC may choose to use actual current prices.

Sources for fuel cost must be clearly documented in model submittals.

IV. PERFORMANCE RATING METHOD FOR LOW-RISE RESIDENTIAL BUILDINGS

Background (Informative)

ASHRAE 90.1 scope excludes low-rise residential buildings. Energy efficiency of these buildings may be evaluated using the RESNET Home Energy Rating Standard (HERS).

The HERS method is in many ways similar to the method described in Appendix G. The rating is calculated by comparing energy consumption of a Reference Home (comparable to the baseline design of Appendix G) to the energy consumption of a Rated Home (comparable to the proposed design of Appendix G).

The method has several known shortcomings. It was developed with mostly one- and two-family dwellings in mind. For example, it prescribes fixed internal space heat gains per building. A more appropriate approach for multi-family structures would be to make the heat gain proportional to building area or number of bedrooms. The method does not include lighting and appliances in the rating score. Mechanical ventilation is not accounted for.

In addition to that, the rating score is calculated based on Btu energy savings, not energy cost savings.

However, the HERS method is more mature than Appendix G. It provides details on many topics that are not covered by ASHRAE 90.1, such as distribution and infiltration modeling methodology.

Another major advantage of this approach is in the availability of certified software tools such as RemRate and TREAT that automatically generate models of reference and rated buildings based on actual parameters of the proposed design. Use of such tools significantly reduces the modeling effort and simplifies quality assurance.

If the HERS method is adopted, then an approach must be developed to support EMP reporting requirements using information available in the standard HERS report. This is important for maintaining consistent reporting for high-rise and low-rise buildings. Currently HERS requires reporting of rated house energy consumption and cost by end use. TREAT provides similar usage breakdown for the reference home, which may be used in place of the baseline building consumption. However, this information is not part of HERS requirements and may not be reported by other HERS certified software tools.

Pilot Requirements

Low-rise buildings that are in the scope of HERS should be rated using HERS rating method. Separate rating score must be calculated for each non-identical building in the project.

The documentation requirements for the low-rise buildings rated using HERS shall be per Appendix G modified as described in Performance Rating and Documentation Requirements section of this document.

Annual heating, cooling and domestic hot water energy consumption of HERS rated house shall be used in place of the corresponding end uses in the proposed design.

Annual baseline and proposed design appliance and lighting usage shall be calculated using the same procedures and assumptions as for buildings within the scope of ASHRAE 90.1, as modified and described in this document. Interactions of lighting and appliances with heating and cooling (other than internal heat gains incorporated in HERS rating calculations performed by the certified tool) should not be accounted for.

Baseline building consumption and energy cost savings for low-rise buildings: TBD

V. APPENDIX A

Background

Appendix G calls for the following procedure to model the thermal blocks (Table G 3.1(7) of Appendix G):

Where HVAC zones are defined on HVAC design drawings, each HVAC zone shall be modeled as a separate thermal block.

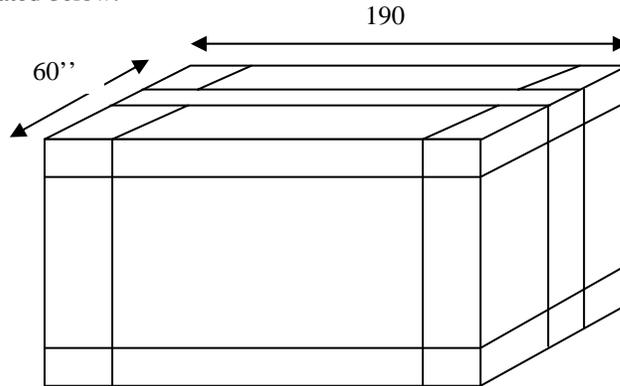
Exception: Different HVAC zones may be combined to create a single thermal block of identical thermal blocks to which multipliers are applied, provided that all of the following conditions are met:

-
- (d) The space use classification is the same throughout the thermal block.
- (e) All HVAC zones in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations vary by less than 45 degrees.
- (f) All of the zones are served by the same HVAC system or by the same kind of HVAC system.

There is an additional requirement for multifamily residential buildings (Table G.3.1(9) of Appendix G):

Residential spaces shall be modeled using at least one thermal block per living unit, except that those units facing the same orientation may be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.

These requirements result in the need to create at least 21 thermal blocks to model a building of even a simple shape illustrated below.



The requirement significantly complicates baseline and proposed design models as well as quality assurance.

For reference, NYSERDA AMP and RESTECH program participants typically model zones in buildings following logic similar to the Appendix G requirements (a) and (c) but not (b), which usually results in less than ten zones per model.

It is important to evaluate whether the extra effort needed to create the detailed models described in Appendix G is justified, by evaluating the effect of it on the Percent Improvement value calculated by Appendix G in the New York State climate.

Testing Procedure

In order to evaluate the effect of detailed zoning on heating and cooling loads and Appendix G Performance Rating (Performance Rating), the following building was modeled:

Location: New York City

Footprint shape: 60'x190' (as show in the sketch above)

Number of stories: 6
 Foundation: slab-on-grade, 6" concrete un-insulated
 Roof: flat, R-15
 Walls: R-13
 Windows: SHGC=0.49, U-value =0.57
 Window area: 30% of exterior surface area.
 Infiltration rate: 0.35 ACH
 Heating system: 80% efficient boiler
 Cooling system: 10 SEER air conditioner
 Distribution system: 100% efficient for both heating and cooling
 Lighting: 0.7 W/ SF
 Plug load: None
 Service hot water load: None

Parameters of the building reflect baseline design requirements of Appendix G for New York climate.

Plug load, service hot water load and distribution losses were not modeled to simplify the testing. The anticipated effects of these simplifications will be discussed later in the document.

Two models were created for the above building:

1 Zone: The building was modeled as a single zone.

21 Zone: The building was modeled as twenty-one zones, as required by Appendix G and as shown in the sketch above.

Energy calculations were performed for the building assuming East-West exposure. The building was then rotated 90 degrees and results were recalculated for South-North exposure.

Calculations were performed using TREAT software, which passes BESTEST Tier 1 and Tier 2 and that employs hourly calculation engine Sunrel developed by NREL.

The results are summarized in Table 1.

Table 1
Annual Energy Cost by End Use

East-West exposure

	Heating	Cooling	Lighting	Total
21 zone	\$12,784	\$5,113	\$7,894	\$25,791
1 zone	\$12,074	\$4,545	\$7,894	\$24,513
% difference	5.6%	11.1%	0.0%	5.0%

South-North exposure

	Heating	Cooling	Lighting	Total
21 zone	\$12,548	\$4,372	\$7,894	\$24,814
1 zone	\$11,931	\$3,594	\$7,894	\$23,419
% difference	4.9%	17.8%	0.0%	5.6%

To estimate the effect of energy cost variations of detailed and simplified models on Appendix G Performance Rating, the following variations of proposed design were modeled for Building A:

- 1H: Replace 80% efficient boiler with 90% efficient boiler
- 2C: Replace SEER 10 air conditioner with SEER 13 air conditioner.

3L: Install occupancy sensor in hallway (modeled by reducing lighting power density in common area by 15%, per Appendix G).

4S: Replace R-13 walls with R-19 walls.

5HCL: heating, cooling and lighting improvements of designs 1H, 2C and 3L were combined.

5HCLS: heating, cooling, lighting and surface improvements of designs 1H, 2C, 3L and 4S were combined.

Energy cost savings and a Performance Rating were calculated for each of the proposed designs, for 1 Zone and 21 Zone models for E/W and S/N exposures. Results are summarized in the table below.

Table 2
Proposed Design Savings and Percentage Improvement

East-West exposure

Proposed Design	1H	% imp	2C	% imp	3L	% imp	4S	% imp	5HCL	% imp	5HCLS	% imp
21 zone	\$1,420	5.5%	\$1,051	4.1%	\$196	0.8%	\$402	1.6%	\$2,487	9.6%	\$3,021	11.7%
1zone	\$1,342	5.5%	\$935	3.8%	\$184	0.8%	\$423	1.7%	\$2,247	9.2%	\$2,834	11.6%
Delta	\$78	0.03%	\$116	0.26%	\$12	0.01%	-\$21	-0.17%	\$240	0.48%	\$187	0.15%

South-North exposure

Proposed Design	1H	% imp	2C	% imp	3L	% imp	4S	% imp	5HCL	% imp	5HCLS	% imp
21 zone	1394	5.6%	899	3.6%	196	0.8%	400	1.6%	2666	10.7%	2840	11.4%
1zone	1326	5.7%	739	3.2%	182	0.8%	426	1.8%	2458	10.5%	2624	11.2%
Delta	\$68	-0.04%	\$160	0.47%	\$14	0.01%	-\$26	-0.21%	\$208	0.25%	\$216	0.24%

% imp. in the table above represents the Performance Rating as described in Appendix G for each of the proposed designs. The difference in performance rating obtained using the simplified and detailed model for each variation of the proposed design is highlighted in red.

Discussion of Results

Understandably, the level of details in the thermal block model has the strongest effect on cooling energy. The cooling cost of the simplified model is underestimated by 11.1% for E/W exposure and by 17.8% percent for S/N exposure. The effect on heating load is much less pronounced, with heating cost underestimated by 5.6% for E/W exposure and by 4.9% for S/N exposure. The total energy cost of simplified model was underestimated by 5.0% for E/W exposure and by 5.6% for S/N exposure.

The performance rating of the simplified model is very close to that of the detailed model. The difference in ratings (delta) is between -0.21% and 0.48%, depending on improvements considered in the proposed design.

The models in the pilot must account for plug loads and service hot water loads that were excluded from this case study. Plug loads contribute to internal heat gains, increasing cooling load and reducing heating load.

Many modeling tools are known to significantly overestimate cooling load in mild climates due in part to the inability to account for natural ventilation (residents opening windows). In the New York State climate it is reasonable to assume that heat gains from plug loads will be compensated by natural ventilation and the cooling energy usage in the building will be similar to that calculated in the case study above. The heating load will be reduced, since natural ventilation does not usually occur in winter.

Plug and service hot water loads are not climate-dependent and will not be affected by thermal block assumptions. After these loads are added to the total energy cost calculated by the model, the relative

variation in the total energy cost and performance rating is expected to go down as the climate-dependent fraction of overall building energy cost diminishes.

Reduction in the number of modeled thermal blocks has the potential to significantly reduce the modeling effort.

The time savings associated with creating fewer spaces will vary depending on interface utilities of the modeling software used. For example, the modeler may create a few spaces manually and then copy/rotate them to generate additional spaces (assuming that the building is symmetrical as in the example above) if their software Graphic User Interface allows it.

However, there will inevitably be the need to change the initial model, for example to reflect modifications in actual design or to correct errors (mistaken surface areas, lighting, etc.). Most of these corrections would need to be done separately for each zone, making effort directly proportional to the number of spaces. Increase in the number of spaces will increase the number of modeling errors and hinder quality assurance.

Appendix B

Fuel Rates

Section G2.4 of Appendix G suggests using 'either actual rates for purchased energy or state average energy prices published by DOE's Energy Information Administration'. DOE data is available at <http://www.eia.doe.gov/emeu/states/states.html>.

More recent monthly data is available at NYSERDA website at http://www.nysesda.org/Energy_Information/energy_prices_supplies.asp

The impact of monthly fluctuation of fuel cost on performance rating may be demonstrated by the following example.

Example: Modeled fuel consumption of baseline and proposed design of a sample building are shown below.

Baseline Model		Proposed Design Model		Savings	
Electric	Gas	Electric	Gas	Electric	Gas
kWh	Therm	kWh	Therm	kWh	Therm
250,000	15,000	230,000	9,000	20,000	6,000

The performance ratings for this building calculated using 2004 monthly electricity and natural gas prices published at NYSERDA website are presented below:

	\$/kWh	\$/therm	% improvement
January	0.133	1.125	18.77%
February	0.14	1.121	18.38%
March	0.14	1.141	18.51%
April	0.141	1.141	18.46%
May	0.142	1.313	19.42%
June	0.15	1.531	20.15%
July	0.154	1.638	20.47%
August	0.153	1.698	20.79%
September	0.153	1.628	20.47%
October	0.15	1.443	19.71%

November	0.151	1.353	19.19%
December	0.144	1.319	19.35%
Average	0.146	1.371	19.54%

18.38% performance rating for February is below the Energy Target of 20%. The rating for the same building calculated using August prices is 20.79% and is above the Energy Target.

Actual local prices will fluctuate more than state average monthly prices, increasing instability of performance rating. The effect of these fluctuations may, at times, be stronger than effect of some of the ECRs that are captured through modeling.

The table below presents the performance rating for the same sample building, calculated using actual electric and gas rates used by three different ECs that submitted EMP models up to date:

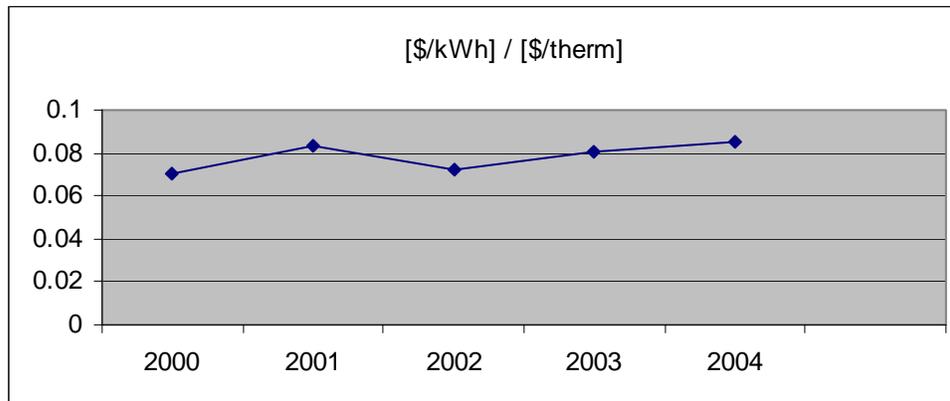
	\$/kWh	\$/therm	% improvement
EC1	0.18	1.4	18.18%
EC2	0.2	1.2	16.47%
EC3	0.12	1.05	19.02%

It is important to note, that since the performance rating is calculated as the ratio of energy cost savings to the energy cost of the baseline building, only the relative cost of different fuels used in the building is important, not the absolute price.

NYSERDA website does not provide fuel prices for different regions of the state, except for oil.

Establishing uniform fuel costs for all the buildings in the pilot independent of location will ensure consistency of ratings throughout the state.

The annual trend for ratio of \$/kWh to \$/therm calculated based on average annual data from NYSERDA website is shown in the chart below.



Fuel costs used in EMP are calculated as the average of monthly costs from October 2004 to September 2005, which is the most recent 12 month period available at NYSERDA website as of the date of this document (1/6/2006).

Actual price becomes important when payback or SIR of energy conservation recommendations is calculated. However, since majority of NYSERDA programs use fluctuating actual fuel costs to calculate these values, EMP can utilize the same approach and allow using actual fuel costs to calculate package SIR for compliance with EMP requirement of SIR>1.1.



Exhibit: Tab K – Project Financing

Form K1 – Condo/Co-op Project Income and Affordability (Tab K)

Financing outlined below must reflect the guidelines in **Section 8.2 (Submission Requirements)**.

Ownership Type: [] Condo [] Co-op

Residential

Residential Gross Square Feet: _____

Residential Saleable Square Feet: _____

Unit Size	# of Units	# of Rooms	Avg. sq. ft. per Unit	Range of Affordability (% of AMI)*	A	B	Total Monthly Housing Cost (sum of columns A and B)	Total Annual Revenue to Co-op/Condo***	Ave. Sales Price per Unit	Total Sales Price
					Owner Monthly Mortgage Payment*	Maintenance to Condo/Co-op**				
Studio										
1 BR										
2 BR										
3 BR										
Other Type										
Other Type										
Super										
Total										

* Use the assumptions given in Form K2.

** Maintenance payments to the Condo/Co-op should include debt service on any underlying mortgage.

*** # of units x Maintenance x 12

Community Space(s)

	Community Space 1	Community Space 2	Total
Gross Square Feet			
Rentable Square Feet			
Average Annual Rent per Square Foot			
Gross Annual Rent			
		Less 10% Vacancy	
		Total Annual Rent	

Parking

	Community	Residential	Total
Number of Spaces			
Purchase or Average Annual Rent Price per Space			
Gross Annual Rent (if applicable)			
		Less 10% Vacancy (if applicable)	
		Total Annual Rent (if applicable)	

Form K2 – Purchase Price and Affordability Calculations (Tab K)

Financing outlined below must reflect the guidelines in **Section 8.2 (Submission Requirements)**. Purchase price and affordability levels must be calculated using the assumptions included in the tables below. Percent AMI affordability for given purchase prices must be calculated using the formulas in the tables below.

Provide calculations on separate worksheets for each unit model type, including unit count, room counts, and net square footages of living space.

Unit Count: _____ Room Count: _____ Net SF Living Space: _____

		Assumptions	Calculation
A	Unit Price		
B	Down Payment	10%	A x .1
C	Mortgage Finance Basis		A – B
D	Annual Fixed Interest Rate	7%	
E	Length of Mortgage Term in Years	30	
F	Monthly Payment Principal and Interest		PMT Calculation
G	Monthly Maintenance Charges + Utility Allowance for electricity and gas (if applicable), see table below.	Include monthly taxes for co-ops only, including assumptions for any proposed tax exemptions.	
H	Monthly Taxes (condos only) and Insurance	Include assumptions for any proposed tax exemptions.	
I	Total Monthly Gross Payment (PITI)		F + G + H
J	Total Annual Gross Payment		I x 12
K	Percent of Income to Housing Deemed Affordable	33%	J / .33
L	Area Median Income for Purposes of Purchase Calculations	\$70,900 (NYC AMI for a family of four)	K / 70,900
M	Household Factor	See table below for appropriate household size	
N	% AMI Affordability		L / M

Apartment Size	Household Size	Household Factor	Electricity Allowance	Gas Allowance
0-BR	1	.7	\$44	\$16
1-BR	1.5	.75	\$48	\$18
2-BR	3	.9	\$54	\$20
3-BR	4.5	1.04	\$62	\$20
4-BR	6	1.16	\$69	\$20
5-BR	7.5	1.28	\$69	\$20

Form K3 – Rental Project Income and Affordability (Tab K)

Financing outlined below must reflect the guidelines in **Section 8.2 (Submission Requirements)**. Use the assumptions given in Form K4 to complete the table below.

Residential

Residential Gross Square Feet:						
Residential Rentable Square Feet:						
Unit Size	# of Units	# of Rooms	Avg. sq. ft. per Unit	Range of Affordability (% of AMI)	Avg. Monthly Rent per Unit	Annual Rent
Studio						
1 BR						
2 BR						
3 BR						
Other Type						
Other Type						
Super						
Total						
					Less 5% Vacancy	
					Total Annual Rent	

Community Space(s)

	Community Space 1	Community Space 2	Total
Gross Square Feet			
Rentable Square Feet			
Average Annual Rent per Square Foot			
Gross Annual Rent			
		Less 10% Vacancy	
		Total Annual Rent	

Parking

	Community	Residential	Total
Number of Spaces			
Avg. Annual Rent per Space			
Gross Annual Rent			
		Less 10% Vacancy	
		Total Annual Rent	

Form K4 – Rent and Affordability Calculations (Tab K)

Financing outlined below must reflect the guidelines in **Section 8.2 (Submission Requirements)**.

All rents by apartment size and affordability levels must be calculated using the assumptions and formulas included in the tables below. Reference the table below for household factors and utility allowances.

Provide calculations on separate worksheets for each unit model type, including unit count, room counts, and net square footages of living space.

Unit Count: _____ Room Count: _____ Net SF Living Space: _____

		Assumptions	Calculation
A	Household Factor	See table below for appropriate household size	
B	Area Median Income for Purposes of Rent Calculations	\$70,900 (NYC AMI for a family of four)	A x 70,900
C	% AMI Affordability		B x % AMI
D	Percent of Income to Housing Deemed Affordable	30%	C x .3
E	Total Monthly Gross Rent		D / 12
F	Utility Allowances	See table below for appropriate electricity and gas allowances by household size	
G	Total Monthly Net Rent to Development		E – F

Apartment Size	Household Size	Household Factor	Electricity Allowance	Gas Allowance
0-BR	1	.7	\$44	\$16
1-BR	1.5	.75	\$48	\$18
2-BR	3	.9	\$54	\$20
3-BR	4.5	1.04	\$62	\$20
4-BR	6	1.16	\$69	\$20
5-BR	7.5	1.28	\$69	\$20

Form K5 – Construction Period Uses of Funds (Tab K)

Complete separate forms for total development and each component (residential and community center) that will be separately financed. Attach a detailed explanation of all assumptions, used in calculations.

	Total	Community Space ONLY
I. PROPOSED CASH PURCHASE PRICE	\$1	
II. HARD COSTS		
Construction Price for Residential Component (\$___ /SF)		
Construction Price for Community Component (\$___ /SF)		
Hard Cost Contingency @ ___% of total Construction Price		
TOTAL HARD COSTS		
III. SOFT COSTS		
A. Financing Costs		
Construction Interest		
Bank Commitment Fee		
Bank Letter of Credit Fee		
Bank Mortgage Insurance Premium		
Bond Issuance		
Negative Arbitrage		
Partnership Publication Fee (if utilizing LIHTC)		
Partnership Management Fee (if utilizing LIHTC)		
Cost Certification (if utilizing LIHTC)		
Other:		
Other:		
B. Pre-Construction Costs		
Appraisal		
Surveys		
Borings		
Title and Recording		
Mortgage Recording Tax		
Mortgage Insurance Premium		
Real Estate Taxes		
Water & Sewer, Utilities		
Permits & Fees (including tax exemption filing fee)		
Insurance		
Bonding/Letter of Credit		
Other:		
C. Professional Fees		
Architect & Engineer		
Landscape Architect/Urban Designer		
Lender Engineering Fee		
Environmental Services (CEQRA)		
Borrower Legal		
Lender Legal		
Syndication Legal (if utilizing LIHTC)		
Accounting		
Other:		
D. Sales/Lease-Up Costs		
Marketing/Sales		
Transfer Taxes (City and State)		
Other:		
Operative Reserve (if utilizing LIHTC)		
TOTAL SOFT COSTS		
IV. DEVELOPER FEE		
V. TOTAL DEVELOPMENT COST		

Form K6 – Construction Financing Sources (Tab K)

If the residential development is financed separately from the community space development, please complete Construction Sources of Financing for the residential component and Construction Sources of Community Financing for the community space component.

If the residential and community space components are financed together, only complete Construction Sources of Financing.

Construction Sources of Financing

	Amount			
Equity		Description of Equity Source		
Cash Equity				
Other Equity Source				
Other Equity Source				
Other Equity Source				
Total Equity				
Loans		Lender	Rate	Term
Bank Construction Loan				
2 nd Construction Loan				
3 rd Construction Loan				
4 th Construction Loan				
Total Loans				
Total Sources of Funds*				

*This amount should be equal to the Total Development Cost.

Construction Sources of Community Space Financing

	Amount			
Equity		Description of Equity Source		
Cash Equity				
Other Equity Source				
Other Equity Source				
Other Equity Source				
Total Equity				
Loans		Lender	Rate	Term
Bank Construction Loan				
2 nd Construction Loan				
3 rd Construction Loan				
4 th Construction Loan				
Total Loans				
Total Sources of Funds*				

*This amount should be equal to the Total Development Cost.

Form K7 – Permanent Financing Sources (Tab K)

If the residential development is financed separately from the community space development, please complete Permanent Sources of Financing for the residential component and Permanent Sources of Community Financing for the community space component.

If the residential and community space components are financed together, only complete Permanent Sources of Financing.

Permanent Sources of Financing

	Amount	
Sales Proceeds (Co-op/Condo)		
Equity		Description of Equity Source
Cash Equity		
Other Equity Source		
Other Equity Source		
Other Equity Source		
Total Equity		

Loans		Lender	Rate	Term	30 Yr Balance
Bank 1 st Mortgage					
2 nd Mortgage					
3 rd Mortgage					
4 th Mortgage					
Total Loans					
Total Sources of Funds*					

*This amount should be equal to the Total Development Cost.

Permanent Sources of Community Space Financing

	Amount	
Estimated Community Space Total Development Cost		
Equity		Description of Equity Source
Cash Equity		
Other Equity Source		
Other Equity Source		
Other Equity Source		
Total Equity		

Loans		Lender	Rate	Term	30 Yr Balance
Bank 1 st Mortgage					
2 nd Mortgage					
3 rd Mortgage					
4 th Mortgage					
Total Loans					
Total Sources of Funds*					

*This amount should be equal to the Estimated Community Total Development Cost.

Form K8 – Condo/Co-op Pro Forma Income and Expense Schedule (Tab K)

Attach a detailed explanation of all assumptions used in calculations.

	Amount	Per DU	Per Room
I. REVENUES			
Gross Residential Income (This amount must correspond to estimates for Total Annual Revenue in Financing Proposal Form K1.)			
Net Residential Income			
Gross Community Income (This amount must correspond to estimates for Gross Income in Financing Proposal Form H2.)			
Less Vacancy @ ____%			
Net Community Income			
Laundry Income			
Parking Income			
Other Income:			
EFFECTIVE GROSS INCOME			
II. EXPENSES			
Janitorial/Cleaning Supplies			
Repairs & Replacements			
Painting			
Grounds Maintenance			
Heating			
Cooking Gas & Electric			
Office Supplies & Equipment			
Elevator Maintenance & Repairs			
Superintendent & Maintenance Staff Salaries			
Security @ ____ hours/day			
Management Fee			
Legal & Accounting/Auditing			
Fire/Liability Insurance			
Real Estate Taxes			
Water & Sewer Charges			
Capital Replacement Reserve			
Other (identify): _____			
TOTAL EXPENSES			
NET OPERATING INCOME			
III. DEBT SERVICE			
1 st Mortgage @ ____ DCR			
2 nd Mortgage @ ____ DCR			
3 rd Mortgage @ ____ DCR			
4 th Mortgage @ ____ DCR			
TOTAL DEBT SERVICE @ ____ DCR			
IV. TOTAL EXPENSES + TOTAL DEBT SERVICE			
V. NET CASH FLOW (NOI less TOTAL DEBT SERVICE)			

Form K9 – Rental Pro Forma Income and Expense Schedule (Tab K)

Attach a detailed explanation of all assumptions used in calculations.

	Amount	Per DU	Per Room
I. REVENUES			
Gross Residential Income (This amount must correspond to estimates for Total Annual Revenue in Financing Proposal Form K2.)			
Less Vacancy @ _____%			
Net Residential Income			
Gross Community Income (This amount must correspond to estimates for Gross Income in Financing Proposal Form H2.)			
Less Vacancy @ _____%			
Net Community Income			
Laundry Income			
Parking Income			
Other Income:			
EFFECTIVE GROSS INCOME			
II. EXPENSES			
Janitorial/Cleaning Supplies			
Repairs & Replacements			
Painting			
Grounds Maintenance			
Heating			
Cooking Gas & Electric			
Office Supplies & Equipment			
Elevator Maintenance & Repairs			
Superintendent & Maintenance Staff Salaries			
Security @ _____ hours/day			
Management Fee			
Legal & Accounting/Auditing			
Fire/Liability Insurance			
Real Estate Taxes			
Water & Sewer Charges			
Capital Replacement Reserve			
Other (identify) : _____			
TOTAL EXPENSES			
NET OPERATING INCOME			
III. DEBT SERVICE			
1 st Mortgage @ _____ DCR			
2 nd Mortgage @ _____ DCR			
3 rd Mortgage @ _____ DCR			
4 th Mortgage @ _____ DCR			
TOTAL DEBT SERVICE @ _____ DCR			
IV. TOTAL EXPENSES + TOTAL DEBT SERVICE			
V. NET CASH FLOW (NOI less TOTAL DEBT SERVICE)			



Exhibit: Tab L – Asset Statement

[Assets Statement must describe financial status within the last twelve months and must be dated and signed.]

Principal or Individual whose assets are described below:

1. Personal Information

Name:

Business Name:

Business Phone:

Marital Status:

Residence Address:

City:

State:

Zip Code:

Business Address:

City:

State:

Zip Code:

Position (Title):

Years of Service:

Salary:

Bonus/Commission:

Other Income:

Source of Other Income:

Gross Life Insurance:

Beneficiaries:

Are you a defendant in any lawsuits or legal action?

If so, please describe:

Do you have any contingent liabilities?

If so, please describe:

2. Statement of Financial Condition

Assets	Dollars (omit cents)	Liabilities	Dollars (omit cents)
Cash On Hand and in Banks		Notes Payable to Banks <i>Secured</i>	
Notes Receivable		Notes Payable to Banks <i>Unsecured</i>	
Mortgages Owned See Schedule A		Notes Payable to Others <i>Secured</i>	
		Notes Payable to Others <i>Unsecured</i>	
Marketable Securities Owned See Schedule B		Debt Balances in Margin Accounts with Brokers	
Real Estate Owned See Schedule C		Mortgages on Real Estate See Schedule C	
Cash Value of Life Insurance		Loans Against Life Insurance	
Other Assets* (Itemize)		Other Liabilities (Itemize)	
Total Assets		Total Liabilities	
		Net Worth	

* Any interest in a closely held business must be documented by providing a current balance sheet for that business and stating the percent of interest held by the applicant.

Schedule A: Mortgages Owned

List Separately and check (X) next to those pledged as collateral.

Mortgages Owned	Dollars (Omit Cents)	Collateral?

Schedule B: Marketable Securities Owned

List Separately and check (X) next to those pledged as collateral.

Marketable Securities Owned	Dollars (Omit Cents)	Collateral?

Schedule C: Real Estate Owned and Property Income

C1. Real Estate Owned

No.	Address	Title in Name of*	% Ownership	Date Acquired	Market Value	Purchase Price	Original Mortgage Amount	Present Mortgage Amount	Maturity Date

*If any title to Real Estate is in any name other than your own, state the extent of your interest, explaining all efforts, claims, or debts against such name.

By whom are present mortgages on property held?

Are any mortgage(s) endorsed or guaranteed? If so, by whom?

C2. Income from Properties

	Real Estate Owned (by property number above)				
	No. 1	No. 2	No. 3	No. 4	No. 5
Present Annual Gross Income <i>Not Including Vacancies and Concessions</i>					
Less Total Operating Expenses and Property Taxes					
Net Income					
Less Amortization and Income Payments					
Net Profit					
Net Rental Value of Present Vacancies					
Annual Rental Value of Space on which lease expires during the next six months					
Net Profit Last Year					
Amount and Classes of Insurance Carried					

List other encumbrances, debts, taxes, mortgage installments or interest past due.

List (circumstances of) any litigation or judgment (s) pending in connection with the above listed properties.

3. Signature Page

For the purpose of procuring and maintaining credit from time to time in any form whatsoever with you, the undersigned hereby represents the above to be a true and accurate Statement signed as of the date herein before set forth and agrees (I) that, if said Statement or any part thereof proves false or misleading in any particular, each and all of the obligation and/or liabilities of the undersigned of every kind to you, whether joint or several, primary or secondary, direct or contingent, shall, at your option, become immediately due and payable all without demand or notice of any kind and (II) that you will be notified promptly in writing of any materially unfavorable changes in the financial conditions herein set forth. Whenever the undersigned may apply to you for credit, and until a substitute Statement may have been submitted to you, this Statement shall have the same force and effect as if delivered at the time such further credit is requested.

Name of Principal: _____

Signature of Individual: _____

Print Name and Title of Individual: _____

Date: _____



Exhibit: Tab M - Project Development Schedule

Please provide a project development schedule.

As referenced in **10.0 Conditions, Terms and Obligations**, the selected Development Team must begin pre-development work within thirty (30) days of the date of the Negotiation Letter. The selected Development Team will be expected to start construction on the date specified in their Post-Designation Timeline, however the Development Team must commence construction no later than eighteen (18) months from the date of the Negotiation Letter.