

BUS Sustainable Project Services

The proposed team shall perform the required research, investigation, and analysis necessary to create a final document acceptable to the SDHC Board of Commissioners. Our preliminary project approach is as follows, but is not limited to the following:

1. Attend a predefined number of meetings w/SDHC staff and Board of Commissioners.
2. Prepare draft and final documents.
3. Research, draft, present and revise, as predefined, the appropriate standards/criteria of acquisition, rehabilitation, new construction, and residential and commercial property management programs w/cost implications including but not limited to:
 - a. Design/quality of living
 - b. Products/materials including cost implications
 - c. Sustainability/conservation
 1. Recycling
 2. Air Quality
 3. Renewable resources
 4. Energy efficiency
 5. Energy generation
 6. Construction methods
 7. Water conservation
 8. Landscape Design

Processes that we recommend be included in our research and delivery at this preliminary phase are as follows:

- CA Green Building Standard
- CA Title 24 Energy Compliance
- The (under-development) CA Comprehensive Residential Building Retrofit Program of the CA State Energy Program (SEP)
- SD AB 811 “Clean Generation” Property Assessment Financing Program
- The near-final CA Home Energy Rating Service (HERS) 2 program and standards for Existing Buildings
- CA Solar Initiative’s (CSI) Multi-Family Affordable Solar Housing (MASH) 2 program
- HUD Neighborhood Stabilization Program
- Coordination with and expertise resourcing from state’s Weatherization Assistance Program (WAP) and Low-Income Heating Assistance Programs (LIHEAP) and local providers/intermediaries of those, the MAAC Project and SDGE respectively.
- Coordination with green building/energy standards and code bodies including the CA Building Standards Commission, the CEC Green Building program administrators, statewide clean energy and green building standards/programs/consulting firms including if needed:1) KEMA Services, 2) Bevalqua Knight Inc (BKI), 3)Richard Heath and Associates, 4) Build It Green (GreenPoint Rating System), 5) California Building Performance Contractors Association (CBPCA), 6) California Association of Building Energy Consultants (CABEC)
- Consultation with the local California Center for Sustainable Energy (CCSE) and SDGE energy/green building program experts
- Compliance with Building Performance Institute (BPI) Analyst (and “do no harm”) standards for 1) Combustion Safety, 2) Lead-Safe Remodeling and 3) OSHA safety.

- Evaluation and recommendations of existing and emerging software solutions for: 1) Energy Compliance and Reporting including EnergyPro and others, 2) Energy Retrofit management software such as Enerpath, EnergyARM and others for cost-effective administration, automation and integration of program agency and workforce and jobsite partners, and 3) and software solutions to ensure compliance with ARRA Stimulus Transparency, Reporting, and Davis Bacon Prevailing Wage compliance.
- Coordination with various Community Action Agencies and other city agencies including the SD Housing Opportunities Collaborative, the SD Workforce Partnership, the SD Community College System, the SD Urban League, United GREEN and others to ensure the program dovetails with Green Jobs training and workforce development initiatives, especially for low-income and veteran populations.
- Coordination with Universal Design, ADA Compliance, and NAHB “Aging In Place” standards.

One or more of these measures could improve the energy performance of existing residential structures in a cost effective manner. These measures are described in Brown & DeKay “Sun, Wind and Light” and are summarized below:

- Thermal air collector walls and roofs capture solar heat at the edge of a room in a layer of air, which carries heat to storage in a building’s structure (Heating and Cooling) (pp. 178-181). These devices would result in an estimated savings of 48% to 75% by using a 650 to 1,300 SF air collector (1% to 2% of the estimated 65,000 SF residential units floor area or roof area) for south facing walls and roof surfaces.
- Stack Ventilation through rooms is increased by greater distance between high and low openings. (Cooling) (pp. 185 -187). Assuming a stack that is the same 40’ height as the peak of the roof a heat removal rate of 120,000 BTU/hr. (20 BTU/hr./SF - a 100 ton air conditioner equivalent) could be realized with stack ventilation cross-sectional areas of (1,200 SF) 6% of the 20,000 SF 1st floor FA, 7% of the 2nd floor FA and 8.5 % of the 3rd floor FA. Stack ventilation from the hallways and the connecting passages between the three modules in each residential unit could be effective in creating drafts to facilitate the operation of the Coolerado M50 air conditioners discussed in Section 5 below.
- Wind Catchers can capture breezes above roof level for buildings whose windows have little access to breezes (pp. 188-190). These need to be at least 8’ higher than the peak of the roof and could possibly operate in concert with stack ventilation
- Night Cooled Mass: Building thermal mass can be used to absorb heat during the day and then be cooled during the night with ventilation (Cooling) (pp. 191-193).
- Evaporative Cooling Towers can supply cool air to rooms or a walled outdoor recreational/work area without the use of fans or wind (Cooling) (pp. 194-196).
- Double Skin Materials should be selected to reflect solar heat and avoid transmitting heat to the inner layer. (Cooling) (pp. 225 -227).
- Sunny Breathing Walls can preheat fresh air for ventilation and reduce solar heat gain. (Heating and Cooling) (pp. 237-238).

Recommended Waste-to-Energy (W2E), HVAC, DHW and Solar PV systems are listed below and described in Paragraphs 1 through 7. Those improvements having the greatest ROI are listed first.

Recommended EE/RE Measure	ROI (%)
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- Waste-to-Energy (W2E) CoGen power plant. 208%
- GHX waste water heat recovery. 30%
- Solar Water Heating (SWH) system connected to a district heating and cooling distribution network. 10%
- ADsorption Chiller™ powered by SWH and W2E system “waste heat” 21%
- Coolerado M50 indirect-evaporative air conditioners. 26%
- Energy Recovery Ventilators. 30%
- Solar PV power generation. 7%

SUSTAINABLE STRATEGY FOR NEW CONSTRUCTION:

In view of the critical need for ensuring that SDHC sustainable new development program standards are firmly tied to regionally appropriate and broadly recognized rating criteria such as the LEED, Global Green, or GreenPoint Rating systems the BUS Team recommends an holistic program of long-term cost-effective best practices that could be implemented by an SDHC developer partner or project architect.

Our strategy shall describe the role of sustainable practices in enhancing the quality of architecture by outlining methodologies, incentives, and policies in achieving sustainable standards for SDHC buildings and define applicability thresholds for implementation from proposed Commission and/or developer projects. These standards shall be coordinated and integrated with the City of San Diego’s regulatory building process and permitting elements. The Sustainable program shall address the following accepted criteria:

Sustainable Sites

- Site selection
- Development Density and Community Connectivity
- Brownfield Redevelopment
- Public Transportation Access
- Selecting Infill Sites Located Within an Urban
- Housing Density of 15 Units Per Acre or More
- Mixed-Use Developments
- Building Placement & Orientation
- Design for Walking & Bicycling
- Social Gathering Places
- Parking Capacity
- Maximize open space
- Heat island Effect reduction for Roof and Non-roof Conditions

Water efficiency

- Address Site Run-Off

- Eliminate Water Pollution
- Construct Practical Bioswales For Water Quality Treatment
- Use Pervious Paving And Surfaces
- Tree Planting for Solar Shading
- Effective Planting For Low Water Use
- Erosion Control Solution
- Irrigation Water Conservation Solutions
- Rainwater Collection And Re-Use
- Gray Water Collection, Storage, Filtration and Re-Use
- Specify Drought-Tolerant California Natives
- Water Use Reduction
- Innovative Wastewater Technologies
- Specify Water-Efficient Fixtures
- Use Recycled Water for Landscape Irrigation or to Flush Toilets/Urinals
- Use Captured Rainwater for Landscape Irrigation
- Provide Water Submetering for Each Residential Unit & Non-Residential Tenant

Energy and atmosphere

- ENERGY STAR fixtures and appliances
- Passive Solar Heating
- Thermal Mass Behind South-Facing
- Radiant Hydronic Space Heating
- Solar Water Heating
- Air Conditioning with Advanced Refrigerants
- Provide for Operable Windows or Skylights for Cross Ventilation
- Onsite Electricity Generation
- Set Minimum Energy Performance Levels and Optimize Performance
- On-Site Renewable Energy
- Green Power Purchase Contracts

Materials and Resources

- Use Recycled Aggregate and Flyash in Concrete
- Steel Framing in lieu of wood
- Collection of recyclables for reuse in new construction
- Building reuse, Maintain Existing Walls, Floors, Roof and other Nonstructural Elements
- Construction Waste Management (70% Min.)
- Materials Reuse where possible
- Specify Recycled Content
- Limit Products to Regional Materials
- Use of Rapidly Renewable Materials and Certified Wood
- Construction Indoor Air Quality Management
- Educational Signage Highlighting & Explaining Green Features

Indoor Environmental Quality

- Minimum Indoor Air Quality Performance
- Construction Indoor Air Quality Management Plan—During Construction and Before Occupancy

- Specify Low-Emitting Materials—Adhesives, Sealants, Low-Emitting Materials, Paints and Coatings
- Controllability of systems—Lighting and Thermal Comfort
- Daylight and Views—Daylight

The Sustainability Program shall serve to guide property owners, developers, architects, and designers in developing sustainable projects. The program strategy will create and establish a baseline for private and public projects, with coherent national standards, that address the varying scales, typology, and functions of sustainable buildings. Its intent shall be to promote creativity and encourage innovative approaches to sustainable design, energy efficiencies, and sustainable technologies. Our strategy shall include:

1. Evaluate the use of the U.S. Green Building Council's LEED for Homes, Global Green, and Build-it-Green Rating System to best guide new multifamily residential project design, in relation to the International Building Code (IBC)/Title 24.
2. Develop ecological design strategy for new development, including water purification/pollution reduction
 - A. Stormwater management.
 - B. Waste reduction: building reuse, job site recycling, and efficient use of materials
 - C. On-site management of sewage and organic wastes, such as graywater systems and biological wastewater treatment
 - D. Energy efficiency: efficient thermal envelopes, efficient space and water heating, lighting, controls and monitoring, and appliances
 - E. Renewable energy: photovoltaic's, geothermal pumps, wind turbines, micro-turbines, and fuel cells
 - F. Water efficiency, both domestic and irrigation, including rainwater harvesting for irrigation and possible toilet flushing
 - G. Materials and resources:
 - Durable building envelopes and long-lived materials or assemblies
 - Recycled-content materials
 - FSC-certified woods
 - Safer, less toxic materials, such as alternatives to CCA-treated wood
 - Innovative application of natural materials (characterized by low embodied energy, local availability, good performance, biodegradable, safe, and esthetic)
 - H. Indoor environmental quality, pollution reduction, worker and occupant safety, air cleaning, humidity control, and thermal comfort.
 - I. Operations and maintenance: Monitoring of energy, water, waste, air quality and transportation use.
 - J. Resource-efficient building operations practices, such as recycled-content and sustainable building product selection, specification, and procurement
3. Integrate sustainable guidelines and master specifications for multi-family development projects.
4. Identify partnering opportunities with organizations such as SDGE, Ride-Share, Sempra, and City of San Diego Environmental Services.
5. Development of process, criteria, and techniques for:
 - a. Leveraging creative financing for green buildings
 - b. Common sense green operating and maintenance plans

- c. Commissioning a green multi-family residential project relative to all three pertinent rating systems
 - d. Develop State of the Art Energy modeling and Analysis
 - e. Monitoring, tracking, and post construction evaluation of final projects once they are operational (tracking back to original models)
 - f. Research and evaluate contract documents for green buildings (especially for Building Information Modeling (BIM))
 - g. Commissioning focused Construction management
6. Assess and fine tune building commissioning and close-out processes for Multi-family residential projects.
 7. Define minimum requirements and thresholds for the application of the Sustainable Guidelines for public and private projects.
 8. Meet relevant local, state and federal regulations and requirements to assure maximum funding for affordable housing.
 9. Public Outreach Strategy: Present ideas, gather input and gain consensus for the SDHC Sustainable Multi-family Residential Design and Construction Program. Participate in various forums including public workshops, neighborhood group meetings, and other stakeholder meetings.

We hope that you find this additional information satisfactory and will select this Baucentrum Urban Studio Team to carry out your "Architectural / Green Sustainability Consulting Services"