Southern Nevada Green Building Partnership (SNGBP)

Participant Handbook

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OVERVIEW

The Southern Nevada Green Building Partnership (SNGBP) program allows production builders who construct single-family homes in Southern Nevada to exceed the 2012 International Energy Conservation Code (IECC) in an "above code" program. The above code features required in the SNGBP program produce electric, gas, and water savings beyond current code requirements.

Sampling has been approved for "above code" programs by the Las Vegas jurisdictions by adopted local amendments. The SNGBP is an "above code" program that permits sampling of new homes that exceed the 2012 International Energy Conservation Code (IECC). Sampling inspects the energy features of one home in seven (15%) instead of inspecting every house (100%) as required by the 2012 IECC. The sampling protocols followed are established by the Energy Star for Homes Sampling Protocol Guidelines.

EnergyPro software will be used to review and validate the energy efficiency modeling performed by the builder's energy consultant required for participation in the SNGBP program. This software will allow builders to model and calculate several energy efficiency credits not recognized in REMRate. The software algorithms and energy credits have been established by field studies performed for hot and dry climates by consultants to the California Energy Commission (and currently used in the California Energy Code, Title 24, Part 6).

The SNGBP program is effective December 2014. Depending upon the Southern Nevada jurisdiction new homes must be built to the 2012 IECC beginning in July to September, 2014. All production homebuilders are encouraged to apply to the SNGBP program.

GLOSSARY OF TERMS

Throughout this document, acronyms of certain terms have been used to simplify instructions. The following is a list of these terms:

Acronym	Definition
CHEERS	ConSol Home Energy Efficiency Rating Services, Inc.
HERS	Home Energy Rating System
RNC	Residential New Construction
SF	Single Family
SNGBP	Southern Nevada Green Building Partnership
SNHBA	Southern Nevada Home Builders Association

INTRODUCTION

Program Sponsors

The Southern Nevada Home Builders Association (SNHBA) is the primary sponsor of SNGBP. SNHBA is dedicated to enhancing the quality of life by meeting the housing and community development needs of Southern Nevada. Founded in 1953 by 12 local homebuilders and incorporated with the State in 1954, SNHBA ranks as the oldest and largest local trade organization representing the residential construction industry. SNHBA has over 360 member companies including homebuilders, trade contractors, suppliers and industry professionals in the homebuilding industry.

Program Administrator

ConSol Home Energy Efficiency Rating Services (CHEERS) is a certified Home Energy Rating Services (HERS) provider. CHEERS maintains a unique online Registry of certification documents that links the homebuilder, Rater, and energy analyst to the rating process. CHEERS also trains and certifies home energy Raters for the building industry. CHEERS will use EnergyPro software to review and validate the energy efficiency modeling performed by the builder's energy consultant required for the SNGBP program. This software will allow builders to model and calculate several energy efficiency credits not recognized in other energy modeling software such as REMRate.

General Project Eligibility

The SNGBP Program is open to single-family new construction homes built in Southern Nevada.

Program Design

This program is a prescriptive approach to new construction energy savings based on energy efficiency modeling. The program exceeds the minimum criteria for 2012 International Energy Conservation Code (IECC) and meets the minimum criteria for the 2012 SNGBP Program.

Field inspections are under the current Energy Star for Homes Sampling Protocol Guidelines, which are performed during and after the completion of construction confirming that all features comply with the design specifications provided in the program.

GENERAL REQUIREMENTS AND ELIGIBILITY

To participate in the SNGBP program, builders will agree to include the following energy features, which include, but are not limited to the following. These requirements are minimums. Participants may use more efficient energy features.

- One of the following 2 envelope verification measures:
  - Quality Insulation Installation (QII) Checklists http://www.nvgreenbuilder.com/forms.php
  - Energy Star Thermal Enclosure Rater System Checklist http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Inspection_Checkl ists.pdf
- 14.0 SEER air conditioner
- 11.7/12.2 EER air conditioner
- Refrigerant Charge Verification
- 80% AFUE natural gas furnace
- 0.62 EF natural gas water heater[1]
- Fan watt draw and adequate airflow HERS tests for air conditioning air flow
- Programmable thermostats http://www.energystar.gov/ia/partners/product_specs/eligibility/thermostats_elig.pdf
- High-efficacy lighting - interior and garage lighting, percentage CFL = 90%
- Water efficient faucets, showerheads and toilets
  - Kitchen faucet (2.0 gpm max.)
  - Bathroom sink faucets (1.5 gpm max.)
  - Showerheads (2.0 gpm max)
  - Toilets (1.28 gpf max)
- Room by room airflows (models only) verified by HERS rater – see System Balancing, **Appendix A**.

[1] If using a storage water heater with a capacity of equal to or greater than 75 gallons or 75 kBTU, the EF needs to be 0.81.

Builders participating in the program are subject to the following:

- Employ an energy modeling company for completion of the required energy analysis using EnergyPro approved software.
- Upload approved EnergyPro CF-1R plan energy modeling files to the CHEERS registry.
- Submit all required documentation to CHEERS including project application, plan review checklist, construction plan set and equipment/material specification sheets.
- Employ CHEERS certified 3rd Party SNGBP HERS Rater to verify the SNGBP program energy features.
- Enter third party HERS inspection results into the CHEERS registry.

Builder's successful participation in the SNGBP program will generate a SNGBP certificate per qualifying lot for the local building departments. The SNGBP certificate will identify the energy features used to qualify for the 2012 IECC, the SNGBP features, and the test results for that home.

PROGRAM PROCESS OVERVIEW

How to Apply

To apply, a builder, or builder representative, must complete the following 4 steps:

1. Contact CHEERS via email SNGBPsupport@CHEERS.org or phone 1-800-424-3377 to receive assignment of a CHEERS SNGBP program representative.
2. Complete, sign, and return a SNGBP Program Contract and Software License Agreement if they are not already on file with CHEERS. A copy of a Program Contract and Software License Agreement can be found on the CHEERS website at http://www.nvgreenbuilder.com/.
3. Submit all required program documentation to CHEERS (see below for detail).
4. Contract with an energy modeling company to complete the required SNGBP energy modeling and submit all required energy modeling documentation (CF-1R's) to CHEERS.

Required Submittal Documentation

To complete the application process, please complete and submit the following required information:

- Project Application
- Plan Review Checklist
- Construction Plan Set
- Compliance Input Files
- Equipment & Material Specification Sheets
- Program Application Fee ($250 Per Master Plan)[2]

Submittal Methods

You may submit the above documentation to CHEERS via the following methods:

OPTION 1: Upload to CHEERS FTP Site (Preferred)

Please email SNGBPsupport@CHEERS.org to request access to the CHEERS SNGBP FTP site. A CHEERS support representative will email you the following information within 24 hours:

- Secure Web Address
- Login Name
- Password

[2] Payments can be made to CHEERS via a check, credit card, or PayPal payment. Please make checks payable to CHEERS and mail to Attn: SNGBP Program, 5757 Pacific Avenue, Suite #220, Stockton, CA 95207.

The folder structure for the site is the following:

- Client Name
  - Project Name
    - Submittal/Plan Check Documents

A CHEERS support representative is available to assist you with any questions on how to navigate or use the site.

OPTION 2: Email

You may submit the required information via email to SNGBPsupport@CHEERS.org.

OPTION 3: Mail

You may mail the required files on a CD or thumb drive, along with a check for the Program Application fee to:

CHEERS
Attention: SNGBP Program
5757 Pacific Avenue, Suite #220
Stockton, CA 95207

Builder Reminder!

- Employ an energy modeling company for completion of the required energy analysis.
- Employ a CHEERS certified 3rd Party SNGBP HERS Rater to verify the SNGBP program energy features.

Plan Check & Application Acceptance

CHEERS will begin the program plan check process once a program contract is on file and all of the following project specific items have been received:

- Project application
- Project application (plan check) fee
- Plan review checklist
- Construction plan sets[3]
- Certificate of compliance forms and related electronic input files[4]
- Equipment and material specification sheets (Note: Completed mechanical/plumbing designs that specify equipment and material specifications will suffice.)

CHEERS will issue a program "Application Approval Letter" to the client once all required program documentation has been received and approved by CHEERS personnel. The "Application Approval Letter" should be provided to the applicable Building Department by the builder (Note: CHEERS is not responsible for submitting builder plans or documentation to a building department).

HERS Rater Certification

In order to become an approved SNGBP Rater, Raters currently certified by any HERS provider (RESNET, CHEERS, etc.) will have to complete the following steps:

1. Complete the SNGBP CHEERS online training course.
   a. The online course is a self-study program conducted at your own pace. It covers the following:

[3] Construction plan sets include architectural drawings, window and door schedules, elevation/wall/roof/floor construction assemblies, floor finish schedule, and a list of lots, addresses, and their respective plan numbers. Plans sets should be submitted electronically to CHEERS.

[4] EnergyPro electronic input files submitted to CHEERS should have a ".bld" file extension.

i. Program overview
ii. Rater and job safety
iii. Duct Leakage
iv. Building Air Leakage
v. Fan Watt Draw and Cooling Coil Airflow
vi. Refrigerant Charge
vii. HVAC Components and Devices
viii. Air Distribution Systems
ix. Mechanical Ventilation
x. Quality Insulation Installation

b. In addition, each section has a practice quiz which has to be completed prior to moving on to the next section.
c. At the end of the course the Rater will need to take a self-administered, open book, online test with a passing score of 80% or above in order to successfully pass the course.

2. Complete the EPA 608 Type II certification
   a. This is a self-study course covering federal regulations in regards to refrigerant handling. This certification is a nationwide requirement for anyone who handles refrigerant and conducts the refrigerant charge diagnostic test, which in this case is required per program requirements.
   b. In order to study at the own pace and leisure, the Rater will be provided with a packet which includes a study book, a quick reference guide, and study audio CDs.
   c. In order to gain this certification, the Rater will need to pass a proctored, closed book exam with a passing score of 72% or above.

All initial training is at no cost to the Rater and sponsored by the SNGBP program. Additional costs to the Rater may be accrued in the event of repeated test failures during the certification process.

Raters can sign up for training through the Official SNGBP website (www.nvgreenbuilder.com) or directly through the CHEERS training website (www.cheerstraining.com).

Field Verification & Sampling

Project set up and upload or completion of program documentation (i.e. CF1R, inspection forms, etc.) are part of the standard CHEERS Registry interface. The SNGBP CHEERS program registry can be accessed at the following location: www.cheersnv.org

SNGBP Sampling - See SNGBP Sampling Protocols, **Appendix B**.

Quality Assurance

CHEERS field verification of the SNGBP program is done using the CHEERS Quality Assurance Process (QAP). CHEERS QAP is designed to provide impartial and effective quality assurance to projects participating in the SNGBP places a high priority on Quality Assurance. The following guidelines apply to all homes evaluated under the CHEERS QA Process:

- Homes chosen for CHEERS QA evaluations are randomly selected by CHEERS.
- At a minimum, QA percentage thresholds are met by rounding up to the nearest whole number for each lot tested by a Rater.
- Raters are not informed that a building/installation will be field checked until after they have completed the original rating and all rating paperwork has been submitted.
- All QA evaluations conducted by CHEERS QA personnel are documented in the CHEERS database; including QA testing results and summarized/submitted to the SNHBA and participating utilities biannually.
- QA reports are placed in the Rater's file. Within 5 business days of receiving a request from a Rater, an electronic (PDF) copy of the completed QA report will be sent to the Rater.

Program Certificates

Registered CHEERS users will be able to generate a SNGBP program certificate for all lots that successfully meet the program requirements including, but not limited to:

- Successful completion of all aforementioned program and project application submittal tasks
- Successful completion of the program plan check review process
- Accurate registering of 3rd Party HERS inspections with the CHEERS Registry
- Timely payment of all program and project related fees
- Conformance with program terms and conditions
- Compliance with CHEERS field verification and QA Program

PROGRAM FEES

Application Fee

The builder will be charged a plan check processing (Application) fee of $250.00 per plan. Each application must be submitted on a per project level and include the $250 fee for each plan being submitted and built in the project.

Certificate Processing Fee

The builder will be charged $35.00 per lot whether it passes or fails. If the lot fails, no certificate will be provided. *[Note: The SNGBP program reserves the right to charge additional processing fees if additional work is required to verify and pass a lot that has initially failed to qualify for program certification.]*

TERMS AND CONDITIONS

Program Contract

The terms and conditions are outlined in the Program Contract, which must be completed by each participating builder prior to entry into the SNGBP program.

FOR MORE INFORMATION

Contact CHEERS

Email: SNGBPsupport@cheers.org
Phone: 1-800-424-3377 office or 866-377-6251 fax
Website: www.nvgreenbuilder.com/

Program Manager: Tony Martinez
Phone: (209) 473-5022
Email: tmartinez@CHEERS.org

APPENDIX A – Air Distribution System Balancing

Balancing a central-air system means adjusting airflow so that all rooms are cooled and heated properly, as specified as specified by the approved design. The balance achieved will affect the central-air performance and it will also affect the monthly cooling and heating bill. The following general procedures can be used to balance the air duct distribution system:

1. Make sure all register vents and dampers are fully open.
2. Use a flow hood to measure and record the supply and return air flow from each duct. Compare findings to the approved design to establish what ducts, if any, require balancing.
3. Locate the dampers in the ductwork.
    a. The branches that come off of the main duct(s) will have the damper inside. You will also find dampers near junction boxes.
    b. You can find a damper by looking for a wing nut protruding from the side of the duct which is used to turn the internal damper that regulates airflow.
4. Unscrew the center locking nut with a screwdriver once the damper wing nut is found.
5. Turn the wing nut to open and close the damper.
    a. When the wing nut sits parallel to the duct the damper will be wide open.
    b. When the wing nut sits perpendicular to the duct the damper will be fully closed.
6. Adjust the dampers according to your needs.
    a. Wide-open dampers will allow maximum airflow.
    b. Half-closed dampers will reduce airflow considerably.
    c. Partially close or throttle the dampers according to the required airflow rate or initially to about one third of the way shut.
7. Re-check the airflow with the flow hood after each adjustment
    a. Steps 6 and 7 might have to be repeated several times.
    b. If unable to reach desired airflow after repeated attempts and damper adjustment combinations, this might be an indication that ducts improvements might be required.
    c. Blower speed can also be increased or decreased to adjust airflow.
    d. Be sure to keep the system static pressure in mind when making these adjustments.

    IMPORTANT:
    Do not fully close all dampers or a high percentage of them. To do so will increase the risk of compressor and/or heat exchanger failure.

8. Once the desired airflow is reached, mark the positions of the wing nut and turn the lock-nut screw to lock the damper in place.

APPENDIX B – SNGBP Sampling Protocols

SAMPLE GROUP CREATION

After the initial model field verification and diagnostic testing is completed as specified, the dwelling units to include in the group that require HERS verification will be defined. The maximum number of dwelling units allowed in a sample group will be seven (one tested lot plus a maximum of six sampled lots).

Each dwelling unit in a designated group shall have all SNGBP measures requiring HERS verification as the other dwelling units in the designated group.

Dwelling units in a designated group shall all be located within the same enforcement agency jurisdiction and subdivision or multifamily housing development.

HERS RATER ACTIONS

The following criteria shall be met as prerequisite to attaining HERS verification compliance for the group:

- All of the dwelling units contained in the sample group have been identified. A maximum of seven dwellings are allowed to be included in a "sample group" for HERS compliance.
- Installation of all the measures that require HERS verification has been completed in all the dwellings that are entered in the group.
- At the request of the builder or the builder's authorized representative, a HERS Rater shall randomly select one dwelling unit from the sample group for field verification and diagnostic testing.

The HERS Rater shall not notify the builder when sample testing will occur prior to the completion of the work that is to be tested.

If the dwelling unit meets the compliance requirements, this "tested" dwelling and also each of the other "not-tested" dwellings in the group shall receive a registered Certificate of Verification. If the test fails, then the failure must be recorded even if the installer immediately corrects the problem.

Whenever the builder changes subcontractors who are responsible for a feature that is being diagnostically field verified and tested, the builder shall notify the HERS Rater of the subcontractor change and terminate sampling for any affected groups. Dwelling units with installations completed by new subcontractors shall be included in a new sampling group.

RE-SAMPLING

"Re-sampling" refers to the procedure that requires testing of additional dwellings within a group when initial selected sample dwelling from a group fails to comply with the HERS verification requirements.

When a failure is encountered during sample testing, the failure shall be recorded. Corrective action shall be taken on the failed dwelling unit and the dwelling unit shall be retested to verify that corrective action was successful. Corrective action and retesting on the dwelling unit shall be repeated until the testing indicates compliance and the successful compliance results have been recorded. Whereupon, a registered Certificate of Field Verification (FV-1) for the dwelling shall be made available to the HERS Rater, the builder, and the enforcement agency.

In addition, The HERS Rater shall randomly select for re-sampling one of the remaining untested dwelling units in the group for retesting of the feature that failed. If the testing of the second randomly selected dwelling unit in the group confirms that the requirements for compliance credit are met on that unit, then the dwelling unit

with the initial failure shall not be considered an indication of failure in the remaining untested dwelling units in the group.

If field verification and diagnostic testing of the second sample results in a failure, the HERS Rater shall report the second failure to the Program Manager, the builder, and the enforcement agency. All dwelling units in the group must thereafter be individually field verified and diagnostically tested to confirm compliance for the feature that failed to comply with re-sampling. In cases where corrective action would require destruction of building components, the builder may choose to reanalyze compliance and choose different measures that will achieve compliance. In this case a new plan check review application shall be completed and submitted to the Program Manager, the HERS Rater, and the enforcement agency. Even with a new Certificate of Compliance (CF-1R), the dwelling unit must be individually field verified and diagnostically tested. Upon verification of compliance, the HERS Rater shall report the test results to the Program Manager. Whereupon the Program Manager shall make available to the HERS Rater, the builder, the enforcement agency, and other authorized users of the HERS Provider data registry, a registered copy of the Field Verification Form (FV-1), for each individual dwelling in the group.