GEOTHERMAL ENERGY SERVICE AGREEMENT

This Geothermal Energy Service Agreement ("Agreement") is entered into as of the 21st day of September 2022 ("Effective Date"), by and between Vermont Gas Systems, Inc. ("VGS") with a principal place of business at 85 Swift Street, South Burlington, Vermont 05403 and The Rutland Hospital, Inc. dba Rutland Regional Medical Center ("RRMC"), a Vermont not for profit corporation, with principal place of business at 160 Allen Street, Rutland, Vermont 05701.

WHEREAS, VGS is offering Geothermal Energy Services through a program pilot;

WHEREAS, RRMC is interested in upgrading its current heating and cooling equipment to geothermal service at RRMC's Diabetes and Endocrinology Center, located at 8 Albert Cree Drive, Rutland, Vermont (the "Site"); and

WHEREAS, VGS has proposed installing, operating, and maintaining Geothermal Facilities at the Site and RRMC has accepted its proposal pursuant to the terms of this Agreement.

NOW THEREFORE, the parties agree as follows:

GEOTHERMAL FACILITIES AND SERVICE PERIOD

1. The rights and obligations contained in this Agreement shall become effective on the Effective Date. This Agreement shall continue for the entire duration of the Service Period. After its execution, VGS shall promptly submit this Agreement for approval to the Vermont Public Utility Commission (the "Commission"). In the event this Agreement is rejected, modified, or conditioned by the Commission, this Agreement shall immediately terminate without any further action obligation by the Parties, unless the Parties mutually agree in writing to such Commission modifications or conditions.

2. VGS agrees to provide, and RRMC agrees to utilize, a geothermal–based heating service (referred to herein as the "Geothermal Energy Service") for the Site for a 15-year period commencing on the In–Service Date (the "Service Period").

3. VGS shall construct the Geothermal Facility to meet the peak building loads for heating and cooling documented in the Energy Model attached as Exhibit D. The Energy Model is based on calibrated utility data, assumptions indicated in the energy model report, and the existing envelope blower door test and analysis dated January 3, 2017 provided by Zero by Degrees. The Parties agree that such Energy Model accurately reflects the required capacity to meet the heating and cooling loads of the Site facility based on existing building programming and occupancy. If there are changes to building programming or occupancy, RRMC shall notify VGS so that additional analysis can be performed evaluating change(s) that may be needed for the Geothermal Facility to meet updated loads.

   VGS is not responsible for the interior equipment and maintenance (heat pumps, pipe accessories, insulation, pumps, glycol, and water treatment). RRMC understands that all existing water source heat pumps will be required to be retrofitted to lower geothermal

temperature operation. VGS will not be responsible for any replacement of any interior equipment or accessories indicated above to operate at the lower geothermal water temperatures.

4. The Geothermal Energy Service will use the Geothermal Facilities. The Geothermal Facilities are defined as the equipment and piping installed up to the Delivery Point, to be installed by VGS and as described in Exhibit A. RRMC Equipment is defined as all equipment and piping installed after the Delivery Point both outside and inside of RRMC's building(s) including the ground source heat pump(s) and described in Exhibit B. The Geothermal Facilities and RRMC Equipment are collectively referred to herein as the "Geothermal Network".

5. RRMC will own RRMC Equipment and VGS will own the Geothermal Facilities.

6. The specific location of the Geothermal Facilities and the schedule for installation of the Geothermal Facilities shall be determined by VGS in coordination with RRMC. The delivery point for the Geothermal Energy Service shall be where the new piping connects to RRMC piping on the building exterior. ("Delivery Point").

7. The In–Service Date shall be agreed to and established by the Parties following the completion, testing, inspection, and acceptance of the Geothermal Network by VGS and RRMC. The In-Service Date shall be no later than June 1, 2023. Failure to meet this date will give RRMC the option to terminate the agreement.

8. Beginning on the In-Service Date, RRMC agrees to pay the monthly service fee and other charges specified on Exhibit C, which are for the Service Period only and shall not apply to any Geothermal Energy Service offered following the Service Period.

9. Upon expiration of the Service Period, RRMC may choose, in its sole discretion:

    a. To take full ownership of the Geothermal Network upon full payment of all charges provided for in this Agreement; or
    b. If VGS has developed a tariff applicable to RRMC's Geothermal Network, RRMC may accept Geothermal Energy Service pursuant to the tariff, under which VGS retains ownership and responsibility for the Geothermal Facilities.

10. VGS agrees, at VGS's expense, to install the Geothermal Facilities and to operate and maintain the Geothermal Facilities for the duration of the Service Period. Installation shall meet all applicable code and permitting requirements. VGS to correct any code/permit violations or other deficiencies.

11. VGS shall obtain all permits and approvals required for the installation of the Geothermal Facilities. VGS may use contractors to perform installation, maintenance, and assessment services. VGS and its contractors shall provide proof of general liability insurance at a minimum of $1,000,000 per occurrence, $2,000,000 aggregate, before any work is

commenced on Site, with RRMC named as an additional insured, and provide proof of workers compensation insurance that meets Vermont statutory requirements.

12. RRMC agrees, at RRMC's expense, to maintain RRMC Equipment, including piping, beyond the Delivery Point. VGS has no obligation to operate or maintain RRMC Equipment or RRMC Appliances, or to correct any code violations or other deficiencies with RRMC Equipment or RRMC Appliances or at the Site.

13. RRMC warrants and represents that to the best of RRMC's knowledge there are no obstructions or conditions that would impair the installation or operation of the Geothermal Facilities at the Site, and that there are no hazardous substances or materials, as defined under State or Federal law, located in the area where the Geothermal Facilities are to be installed. In the event such conditions are found, VGS shall have the right to suspend work and to terminate this Agreement, without any further liability to RRMC.

14. RRMC and VGS shall, prior to the date set for the installation of Geothermal Facilities, coordinate to mark out any private utilities (including, but not limited to, underground electric, sewer, water and septic lines and systems) which are located on the premises where Geothermal Facilities are to be installed in compliance with the State of Vermont "Dig Safe" law.

15. RRMC grants to VGS and its contractors the right and access to install, repair, replace, maintain, and remove the Geothermal Facilities, RRMC Equipment, if necessary, and communication lines for control and metering purposes at the Site, and to monitor, evaluate and enhance the performance of the Geothermal Network. VGS shall provide advance notice of work at the Site. RRMC agrees to execute easement, lease or license agreements on terms satisfactory to RRMC as are necessary to document VGS's right to access the Site, to locate the Geothermal Network at the Site, or to own, operate and maintain the Geothermal Facilities at the Site as provided in this Agreement.

RRMC INSTALLATION

16. VGS shall furnish and install at its expense any equipment necessary for the interconnect of Geothermal Energy Service to RRMC Equipment and RRMC shall own, operate, and maintain RRMC Equipment, unless otherwise agreed upon in writing by VGS and RRMC.

17. VGS reserves the right to disconnect the Geothermal Energy Service at any time without notice or to refuse to connect its service if, to its knowledge and in its judgment, RRMC's installation has become or is dangerous, defective or in violation of VGS's requirements. VGS shall not be required to commence or continue Geothermal Energy Service unless and until RRMC has complied with all requirements of governmental authorities and VGS with reference to the use of Geothermal Energy Service. All inspections, reports, and approvals (where required) must be received in writing by VGS before service shall be commenced or reconnected.

18. RRMC assumes full responsibility for the proper use of Geothermal Energy Service delivered by VGS and for the condition, suitability, and safety of all equipment and appliances on RRMC's premises or owned or controlled by RRMC which is not VGS's property.

19. RRMC shall notify VGS in writing before making any significant change in RRMC's Geothermal Energy Service equipment that would affect VGS's Geothermal Energy Service facilities required to serve RRMC. RRMC shall be liable for any damage to VGS's property caused by RRMC's additional or changed installation if made without prior notification to VGS.

20. RRMC shall not install, own, or maintain Geothermal Energy Service piping across or in the public way or any recorded private way within the immediate vicinity of 8 Albert Cree drive (100 feet) without the prior written consent of VGS in each case obtained.

21. RRMC shall furnish and maintain, at no cost to VGS, the necessary space for housing, fencing, barriers, and foundations, as applicable, for Geothermal Energy Services, installed upon the Site, whether such is furnished by RRMC or VGS. If RRMC refuses, VGS may at its option charge RRMC for acquisition of space needed for furnishing and maintaining the necessary protection of the equipment. Such space, housing, fencing, barriers, and foundations shall be in conformity with applicable laws and regulations and subject to VGS's reasonable specifications and approval.

VGS INSTALLATION

22. VGS shall install, own, operate, and maintain, at its expense, the Geothermal Facilities to the Delivery Point.

23. Prior to the installation of the Geothermal Facilities and RRMC Equipment, if requested by VGS, RRMC shall convey to VGS an easement or similar property interest for the period of this agreement for the Geothermal Facilities owned by VGS to the Delivery Point on terms satisfactory to RRMC.

24. VGS shall not be required to install the equipment necessary to provide its service unless RRMC shall have obtained and provided to VGS at its request all certificates, permits, and licenses from governmental authorities and such grants of rights-of-way easements as may be requisite to enable VGS to install and furnish the requested service. VGS is responsible for obtaining the permits and governmental approvals for the Geothermal Facilities and installation thereof to the Delivery Point. The subsequent termination of any certificate, permit, license, or right-of-way requisite for such service shall terminate any contract then existing for such service without any liability on VGS for breach of such contract or failure to furnish service.

25. Any properly identified employee of VGS shall have access to the premises of RRMC at all reasonable times for the purposes of testing RRMC's load, inspecting the Site and equipment, or repairing, removing, or exchanging equipment belonging to VGS, and for

the purpose of removing its property on the termination of any service agreement or the discontinuance of service. Proof of general liability insurance and workers compensation insurance to be provided to RRMC by VGS on request.

26. All Geothermal Facilities and other equipment owned by VGS shall be and will remain the property of VGS, and no one other than an employee or authorized agent of VGS shall be permitted to remove, operate, or maintain such property. VGS shall be responsible for maintaining insurance on the VGS equipment. RRMC shall not interfere with or alter any property used in connection with the rendering of service or permit the same to be done by any person other than the authorized agents or employees of VGS. RRMC shall be responsible for all damage to, or loss of, such property caused by RRMC unless occasioned by circumstances beyond RRMC's control. Such property shall be installed at points most convenient for VGS's access and service and in conformance with public regulations in force from time to time. The costs of relocating such property shall be borne by RRMC when done at RRMC's request, or for RRMC's convenience, or if necessary to remedy any violation of public law or regulation caused by RRMC.

POSSESSION OF GEOTHERMAL ENERGY

27. Geothermal Energy Service shall be deemed to be in the control and possession of VGS until the Geothermal Energy Service is delivered to RRMC at the Delivery Point. VGS shall not be responsible for the Geothermal Energy Service when the Geothermal Energy Service is not in VGS's control and possession.

28. VGS shall not be liable to RRMC for any loss arising from or out of Geothermal Energy Service, including loss of Geothermal Energy Service in the possession of VGS or for any other cause, except for the negligence of VGS's own employees or agents.

INVOICES AND PAYMENT

29. VGS shall submit invoices to RRMC with sufficient detail to explain and identify any charges. Any amounts not paid by RRMC within 30 days of rendering, shall bear interest, calculated at one (1) percent above the prime interest rate published in the Wall Street Journal, which assessment shall start on the 31st day . Interest, which shall not be compounded, shall be payable monthly, will start to accrue on the 31st day and continue until all outstanding sums are paid.

30. If RRMC disputes a portion of an invoice, RRMC shall immediately inform VGS of the nature of the dispute and shall pay the undisputed portion of the invoice. The parties shall expeditiously and in good faith seek to resolve the dispute. After the dispute is resolved, any amounts due VGS shall be paid in the next invoice cycle.

TAXES AND MAINTENANCE COSTS

31. In the event a tax of any kind is imposed or removed by any governmental authority on the transportation of Geothermal Energy Service or on the gross revenues derived from the transportation of Geothermal Energy Service at retail (exclusive, however, of taxes based on VGS's net income), the rate for service herein stated will be adjusted to reflect said tax. Similarly, the effective rate for service hereunder will be adjusted to reflect any refund of imposition of any surcharges or penalties applicable to service hereunder which are imposed or authorized by any governmental or regulatory authorities.

32. RRMC will be responsible for all taxes or assessments that may now or hereafter be levied with respect to the Geothermal Energy Service or the handling or subsequent disposition thereof after its delivery to the Delivery Point. However, if VGS is required by law to collect and/or remit such taxes, RRMC will reimburse VGS for all amounts so paid. If RRMC claims exemption from any such taxes, RRMC will provide VGS with appropriate documentation. If VGS collected any taxes or assessments from RRMC and is later informed by RRMC that RRMC is exempt from such taxes, it shall be RRMC's responsibility to obtain any refund from the appropriate governmental taxing agency.

TERMINATION AND DEFAULT

33. Termination for Default. "Default" for purposes of this Agreement shall be defined as the occurrence of any of the following:

    a. the failure to make, when due, any payment required under this Agreement, if such failure is not remedied within ten (10) Business Days after written notice from the party to which such payment is due;

    b. a party (i) commences, acquiesces in or is subject to the commencement of a bankruptcy or similar proceeding under any bankruptcy, insolvency, reorganization or similar law, (ii) makes an assignment or arrangement for the benefit of creditors not in the ordinary course of business, or (iii) has a liquidator or similar official appointed with respect to it or any substantial portion of its property or assets;

    c. the failure to perform any material covenant or obligation set forth in this Agreement, if such failure is not remedied within twenty (20) business days after written notice and such failure has a material adverse effect upon the non-breaching party, provided, however, that if it shall be impracticable or impossible to remedy such failure within such twenty (20) day period, the cure period shall be extended for an additional period reasonably necessary to remedy such failure (not to exceed a total of sixty (60) days) subject to the condition that during the additional period, the defaulting party shall diligently pursue a remedy for the failure;

    d. any representation or warranty or statement in the Agreement made by such party proves to have been misleading or false in any material respect when made or when deemed made or repeated, such misstatement has a material adverse effect on the

non-defaulting parties, and is capable of remedy and is not remedied within thirty (30) days after receipt by the defaulting party of written notice of such failure; provided, however, if the false representation or warranty can be remedied and a party has initiated and is diligently attempting to effect a cure during the initial thirty (30) days, the party's cure period shall extend for an additional thirty (30) days; and

e. a party consolidates with or merges with or into, or transfers all or substantially all of its assets to, another person and the resulting, surviving or transferee person fails to assume all the covenants and obligations of such party under this Agreement by operation of law or pursuant to the requirements of this Agreement.

34. Notice of Default. In the event a party is in Default, the non-defaulting party shall provide written Notice of Default with sufficient information to the defaulting party so that it may cure any Default that is subject to cure in the time period provided above. If any Default remains uncured after the expiration of the stated cure period or a reasonable time, as the case may be as provided above if additional time is provided to cure, the non-defaulting party may terminate this Agreement upon written notice of the same.

35. In the event this Agreement is terminated for Default, the non-defaulting party shall have the right (i) if a material Default, to accelerate all amounts then owing between the non-defaulting party and the defaulting party and terminate its obligations under this Agreement, (ii) suspend performance with respect to such defaulting party, and (iii) except as expressly provided or limited in this Agreement, to exercise any other remedy available at law.

CONFIDENTIAL INFORMATION

36. "Confidential Information" means any information disclosed by or on behalf of either party "the Disclosing Party" to the other party "the Receiving Party", either directly or indirectly, in writing, orally or by inspection including, without limitation, (i) product formulations, trade secrets, past, present and future research, development or business activities or the results from such activities, business plans, strategies, methods and/or practices; (ii) information that is not generally known to the public, including, but not limited to, information about personnel, products, customers, marketing strategies, services, financial statements or future business plans; or (iii) the identity of the parties, the fact that discussions are taking place between the parties or the nature thereof. Confidential Information may also include information disclosed to the Receiving Party by third parties. Confidential Information shall not, however, include any information which (i) was publicly known and made generally available in the public domain prior to the time of disclosure by, or on behalf of, the Disclosing Party; (ii) becomes publicly known and made generally available after disclosure by the Disclosing Party to the Receiving Party through no action or inaction of the Receiving Party or any of its representatives; (iii) is already in the possession of the Receiving Party at the time of disclosure by the Disclosing Party; (iv) is obtained by the Receiving Party from a third party without a breach of such third party's obligations of confidentiality to the

Disclosing Party; (v) is independently developed by the Receiving Party or its representatives without use of or reference to the Disclosing Party's Confidential Information; or (vi) is required by law to be disclosed by the Receiving Party (other than by reason of an act taken by the Receiving Party with the primary intent to result in such disclosure), provided that the Receiving Party gives the Disclosing Party prompt written notice of such requirement and the proposed disclosure prior to such disclosure and assistance (at the Disclosing Party's expense) in obtaining an order protecting the information from public disclosure.

a. Non-use and Non-disclosure. The Receiving Party agrees not to use any Confidential Information of the Disclosing Party for any purpose except to carry out work under this Agreement. The Receiving Party agrees to keep confidential and not to disclose any Confidential Information to third parties or to the Receiving Party's employees, officers, directors, attorneys, consultants, financing sources or representatives (collectively, referred to herein as a parties' "Representatives"), except to those Representatives of the Receiving Party who need to know the information for the purpose of assisting the Receiving Party and who have agreed to treat (and the Receiving Party shall cause its Representatives to treat) such information in accordance with these terms as if such Representative were a party hereto (it being understood that the Receiving Party will be responsible for any breach of the terms of this Agreement by any of its Representatives).

b. Maintenance of Confidentiality. The Receiving Party agrees that it shall use its best efforts to protect the secrecy of and avoid disclosure and unauthorized use of the Disclosing Party's Confidential Information. Without limiting the foregoing, the Receiving Party shall take at least those measures that it takes to protect its own most highly confidential information. Any copies of Confidential Information made by the Receiving Party shall be treated as Confidential Information under this Agreement.

c. Return of Materials. All documents and other tangible objects containing or representing Confidential Information which have been disclosed by the Disclosing Party to the Receiving Party, and all copies thereof which are in the possession of the Receiving Party, shall be and remain the property of the Disclosing Party and shall be promptly returned to the Disclosing Party or destroyed upon the Disclosing Party's written request. If the Receiving Party chooses to destroy the Confidential Information, an officer duly authorized by it shall certify in writing that such destruction has taken place. Notwithstanding anything to the contrary in this paragraph 36, (i) the Receiving Party may retain whatever documentation is necessary to comply with its or its Representatives' internal security and document retention policies, and (ii) the Receiving Party may retain Confidential Information if required to do so by law, government regulation, or an authority with regulatory oversight of such party.

The provisions of Section 36 shall survive termination of this Agreement.

INDEMNIFICATION

37. Indemnity Obligations. To the fullest extent permitted by law, each party ("Indemnifying Party") shall indemnify, defend, and hold harmless the other party ("Indemnified Party"), its directors, officers, employees and agents, from and against any and all third-party losses, fines, liabilities, lawsuits, claims, demands or damages whatsoever (including without limitation reasonable attorneys' fees), arising out of any bodily injury (including death) or any damage to or loss or destruction of property to the extent that the injury, damage, loss or destruction occurs or is alleged to have occurred as a result of the errors, omissions or negligent acts of the Indemnifying Party, its employees, or agents in the performance of the Indemnifying Party's obligations under this Agreement, ("Claims"), except to the extent that such Claims result from, in whole or in part, the negligence, unlawful or wrongful acts of the Indemnified Parties or any other person acting in concert with them.

38. Defense of Claim. The potential Indemnified Party shall, with reasonable promptness, provide the potential Indemnifying Party with written notice of the claims that may be subject to indemnification; provided, however, that no delay in providing notice shall relieve any indemnification obligation unless there is material prejudice. The potential Indemnifying Party shall, within thirty (30) days thereafter provide notice whether the claim is subject to indemnification and whether the potential Indemnifying Party elects to undertake, through its counsel and at its sole risk and expense, the settlement or defense of the claim, and if the defense is undertaken, the potential Indemnified Party shall cooperate in connection therewith. If the defense is not undertaken by the potential Indemnifying Party, the potential Indemnified Party shall thereafter have the right to contest, settle or compromise the Claim at its discretion, and the potential Indemnifying Party will thereby waive any claim, that the potential Indemnified Party's settlement or defense is inadequate or unreasonable; provided, however, that such waiver by the potential Indemnifying Party shall not limit any rights of the potential Indemnifying Party under this Agreement.

39. Insurance Requirements. The parties shall use commercially reasonable efforts to obtain and maintain in effect during the entire period for which the parties are obligated to indemnify a potential Indemnified Party under this Agreement, one or more policies of insurance with reputable insurance companies, licensed in the State of Vermont, to ensure VGS's performance of its indemnification obligations under this Agreement. The Indemnified Party shall be covered by such policy or policies in accordance with its or their terms to the maximum extent of the coverage available under such policy or policies.

The provisions of Sections 37-39 shall survive termination of this Agreement.

WAIVER OF CONSEQUENTIAL DAMAGES

40. Each party's liability hereunder shall be limited to direct, actual damages. Neither party shall be liable for consequential, incidental, punitive, exemplary, or indirect damages, lost profits, or other business interruption damages, by statute, in tort or contract. Nothing contained in this Section shall be construed as limiting a party's indemnity obligation for or from third-party claims. It is the intent of the parties that the limitations herein imposed on remedies and the measure of damages be without regard to the cause or causes related thereto, including the negligence of any party, whether such negligence be sole, joint. or concurrent, or active or passive.

FORCE MAJEURE

41. "Force Majeure Event" means any act or event that delays or prevents a party from timely performing all or a portion of its obligations under this Agreement if such act or event, despite the exercise of reasonable efforts, cannot be avoided by and is beyond the reasonable control of and without the fault or negligence of the party relying thereon as justification for such delay, nonperformance, or noncompliance. Without limiting the definition set forth above, Force Majeure Events may include: acts of God, storms, floods, earthquakes, hurricanes, tornados, lightning, ice storms, landslides, mudslides, subsurface or other site conditions, explosion, fire, epidemic, sabotage, vandalism, strikes or lockouts (the settlement of which is in the sole discretion of the affected party), terrorism, an act of public enemy, war, blockade, civil disturbance or any restraint or restriction imposed by law or any directive from a governmental authority, which by exercise of due diligence a party could not reasonably have been expected to avoid and to the extent which the party has been unable to overcome.

42. If a party is rendered unable to perform any of its obligations under this Agreement (other than payment obligations) due to a Force Majeure Event, such party's obligations shall be excused to the extent prevented by the Force Majeure Event, and the other party shall be excused from performance that is related to the suspended performance so long as it is exercising commercially reasonable efforts to eliminate or circumvent the Force Majeure Event condition, until such time as the Force Majeure Event has passed.

BUSINESS REPRESENTATIONS AND WARRANTIES

43. Each party represents and warrants to the other party that:

    a. it is duly organized, validly existing and in good standing under the laws of the jurisdiction of its formation, and has all regulatory authorizations necessary for it to legally perform its obligations under this Agreement;

    b. the execution, delivery and performance of this Agreement is within its powers, has been duly authorized by all necessary corporate action, does not require the consent of any third party to any agreement with such party, and does not violate or constitute

a breach of any of the terms and conditions in its governing documents, any contracts to which it is a party or any law, rule, regulation, order or the like applicable to it;

c. this Agreement, and each other document executed and delivered in accordance with this Agreement, constitutes its legally valid and binding obligation enforceable against it in accordance with its terms, subject to any equitable defenses.

d. it is not bankrupt and there are no proceedings pending or being contemplated by it or, to its knowledge, threatened against it which would result in it being or becoming bankrupt;

e. no default has occurred or would occur as a result of its entering into or performing its obligations under this Agreement.

MISCELLANEOUS

44. Any formal notice or demand sent pursuant to this Agreement shall be sent via nationally recognized overnight carrier, as follows:

If to RRMC: Rutland Regional Medical Center
ATTN: Roger F. Wakeman
160 Allen Street
Rutland, VT 05701
rfwakeman@rrmc.org

If to VGS: Richard Donnelly, Energy Innovation Director
Vermont Gas Systems, Inc.
85 Swift Street
South Burlington, VT 05403
rdonnelly@vermontgas.com

Each party shall update the other party for changes in notice information, if any, without the need to formally amend this Agreement.

Communications other than formal notices shall be undertaken by telephone (with follow up by email), email or any other means agreed upon by the parties.

45. VGS is a public utility subject to regulation by the Vermont Public Utility Commission. Compliance by VGS with any order or rule of the Commission or any other regulatory or legislative authority with jurisdiction shall not constitute a breach hereof. Throughout the term of this Agreement, all VGS performance is conditioned upon the continued maintenance and validity of all permits and rights of way necessary for VGS to operate.

46. Notwithstanding anything to the contrary, termination of this Agreement shall not relieve any party of its accrued and unpaid contractual liabilities.

47. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof, and all prior agreements, and representations with respect thereto, whether written or oral, are superseded hereby. Each party confirms that it is not relying on any representations or warranties of the other party except as specifically set forth herein or in any of these other Agreements.

48. Any provision of this Agreement that is held to be illegal, invalid, or unenforceable under any present or future law shall, if the rights or obligations of any party hereto under this Agreement will not be materially and adversely affected thereby, be fully severable, and there shall be added automatically a legal, valid and enforceable provision as similar in terms to such severed provision as possible and reasonably acceptable to the parties.

49. Neither party may assign this Agreement without the prior written consent of the other party, which shall not be unreasonably withheld. Subject to the forgoing, this Agreement shall be binding on each party's successors and permitted assigns. Any company that shall succeed by merger or consolidation to the assets, substantially or in their entirety, of VGS or RRMC, as the case may be, shall be entitled to the rights and shall be subject to the obligations of its predecessor in title under this Agreement.

50. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of Vermont, without reference to its principles of choice of law. All actions arising out of this Agreement shall be adjudicated before the Vermont Public Utility Commission or in the state or federal courts located in Chittenden County, Vermont.

51. No amendment or modification to this Agreement shall be enforceable unless reduced to writing and executed by the parties. Any waiver of any term or condition of this Agreement must be in writing duly executed by the party waiving such term or condition, and no such waiver shall be deemed to be a future waiver of the same or any other term or condition.

52. This Agreement shall not impart any rights enforceable by any third party (other than a permitted successor or assignee bound by this Agreement).

53. Any number of counterparts to this Agreement may be executed, and each shall have the same force and effect as the original.

54. The headings appearing in this Agreement are inserted for convenience only and in no way define, limit, construe, or describe the scope or intent of any section of this Agreement.

55. Consent to Electronic Transaction. The Parties consent to conduct this transaction by electronic means. Each party agrees that the electronic signatures, whether digital or

encrypted, of the Parties included in this Agreement are intended to authenticate this writing and to have the same force and effect as manual signatures

IN WITNESS WHEREOF, the parties hereto, each by a duly authorized representative, have executed this Agreement as of the date first above written.

THE RUTLAND HOSPITAL, INC. D/B/A RUTLAND REGIONAL MEDICAL CENTER

By: _____

Name: Claudio Fort

Title: President & CEO

Date: 09/27/2022

VERMONT GAS SYSTEMS, INC.

By: _____

Name: Neale F. Lunderville

Title: President & CEO

Date: 09/21/2022

EXHIBIT A

VGS PROPERTY: "GEOTHERMAL FACILITIES"

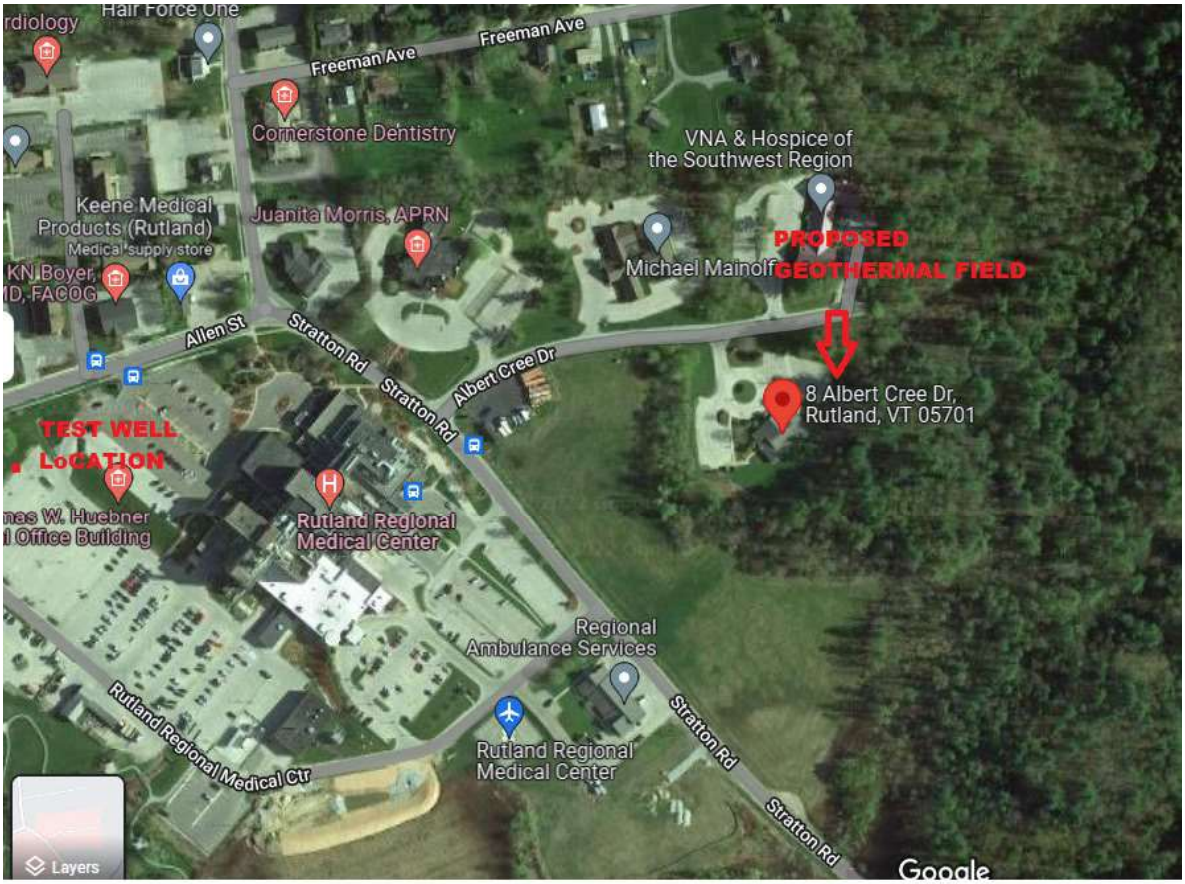
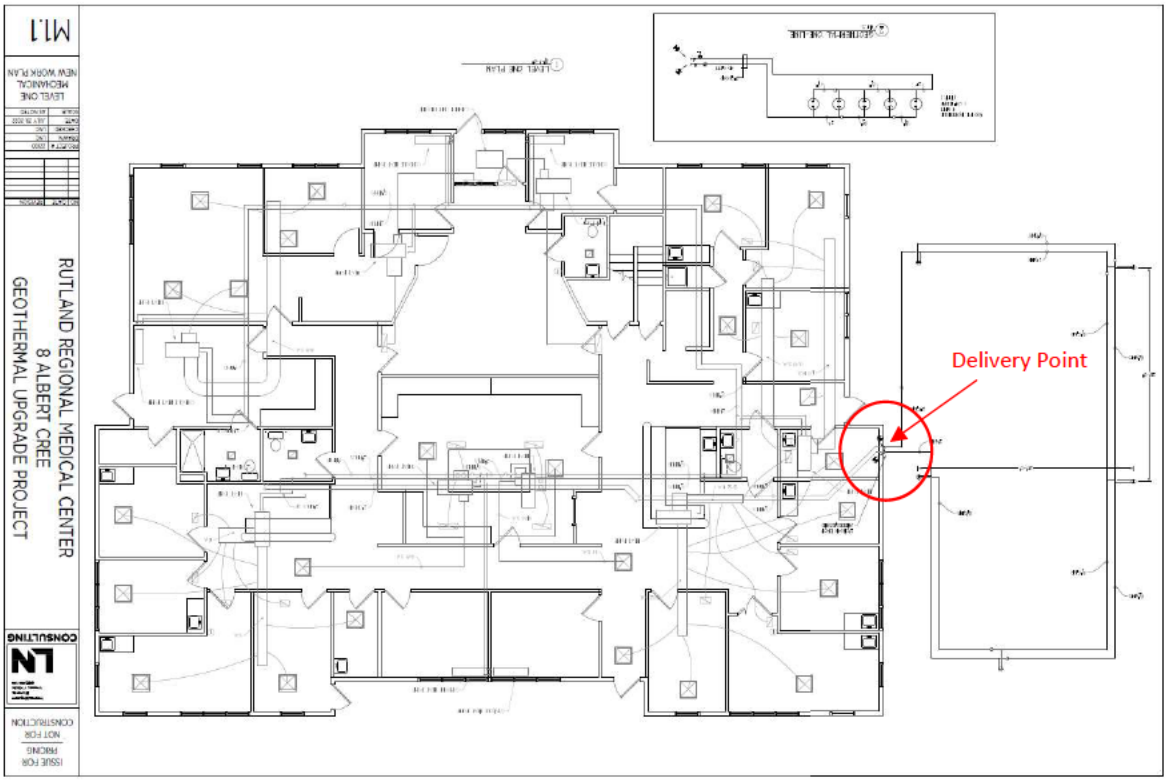


EXHIBIT B

RRMC PROPERTY: "RRMC EQUIPMENT"



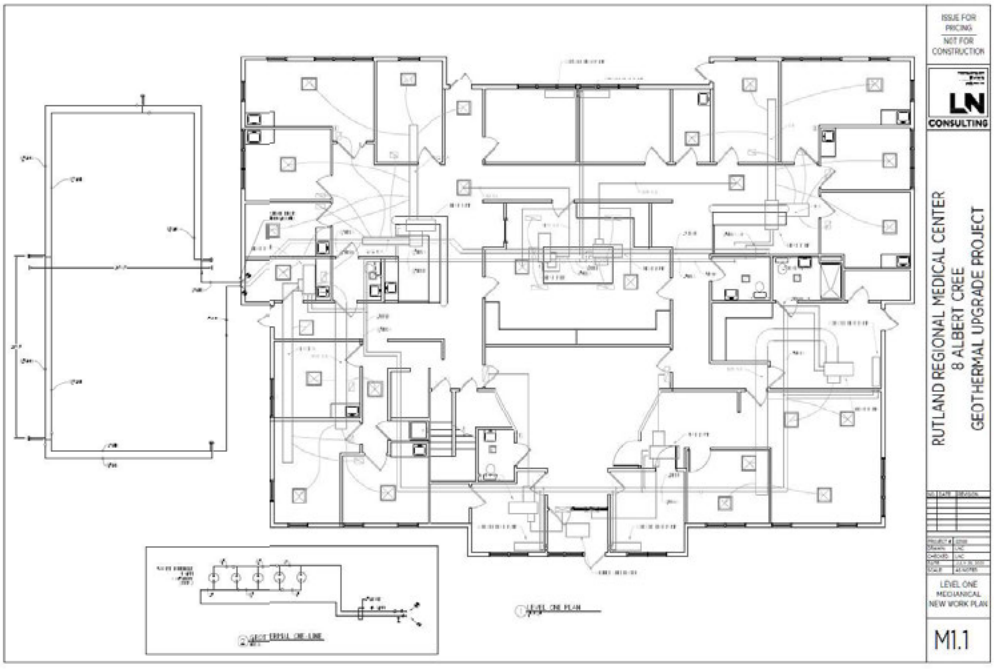


EXHIBIT C

PAYMENT TERMS

In exchange for delivery of geothermal services, RRMC shall pay an annual fee of [redacted], due and payable in [redacted] monthly installments of [redacted].

Preferred payment options are electronic payment through ACH or electronic wire transfer.

Should VGS be eligible for and receive additional 3rd party incentives that reduce the cost of constructing the Geothermal Facilities, these payment terms shall be subject to revision.

EXHIBIT D

RRMC DEC ENERGY MODEL

RRMC Diabetes Energy Model Overview

May 13, 2022

Author/energy mod l r Greg Est

Vermont | 208 Flynn Avenue #2J | Burlington, VT 05401 | (802) 655-1753 | Fax (802) 655-7628
Massachusetts | 32 Masonic St., Unit E | Northampton, MA 01060 | (413) 776-9580
lnconsulting.com

LN CONSULTING

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Executive Summary

The intent of the energy model is to model and calibrate the existing building and compare the energy end use to the proposed geothermal HVAC system. Also, hourly condenser loads are calculated for alternatives 2 and 4 (proposed HVAC system without ventilation and with ERV). The existing HVAC system is zone water source heat pumps (zWSHPs) with mixed water loop served by a boiler and cooling tower. The model was calibrated to existing propane meter data using the existing HVAC system. See section Calibration methods.

The controls will change slightly from the existing HVAC system to the Ground Heat Exchanger (GHX) system. The existing boiler and cooling tower mixed water loop is controlled by dual setpoint with 60F during winter heating and 90F during summer cooling, while the GHX will be uncontrolled and follow the ground temperature. The GHX system will include zone temperature setbacks, while the existing system does not. The existing model will have heating setpoint of 72F and cooling setpoint of 75F, always. The GHX system will model zone heating setpoint of 72F, with a 60F setback, and a cooling setpoint of 75F, with 80F setback.

Table 1 shows the building coincident peak heating and cooling design loads. There is no mechanical ventilation in this building, only restroom exhaust. Figure 27 show the heating design heat balance and Figure 28 shows the cooling design heat balance.

The alternative descriptions are as follows:

- Alternative 1: existing system
- Alternative 2: same as alternative 1, except ground heat exchanger in place of boiler and cooling tower.
- Alternative 3: same as alternative 2, except the heating setpoint temperature is changed to 70F with a 60F setback and the cooling setback temperature changed to 80F.
- Alternative 4: same as alternative 3, except with facility ventilation through an ERV. ERV has high efficiency tempeff HX, air cooled DX cooling coil for temperature and dehumidification.

Table 1. Building coincident peak loads and ventilation design airflow.

Alternative	Building peak heating design	Building coincident peak cooling design	Building design ventilation airflow, CFM
1,2,3	89.45 [kBtu/h]	40.77 [kBtu/h]	0 [CFM]
4	127.67 [kBtu/h] – without heat recovery 98.91 [kBtu/h] – with heat recovery	57.47 [kBtu/h] – without heat recovery 45.02 [kBtu/h] – with heat recovery	689 [CFM]

Figure 1 and Figure 3 show the annual hourly condenser heating and cooling loads for alternatives 2 and 4. These loads are to be used for the sizing of the proposed geothermal HVAC system. The entire building load is being transferred to the condenser as well as compressor heat. For alternative 4, some additional heat load is being added to the mixed water loop due to ventilation. The ERV heat recovery device is so efficient that the lowest the supply air gets during the winter is 69F. This is due to the constant zone (exhaust) heating temperature setpoint of 72F. The mixed condenser pumps have been switched to 0 pump head and do not add heat to the water loop. This hourly load should be imported in GLD for detailed borefield sizing, which can be imported back into the model for final analysis. Figure 2 and Figure 4 shows the condenser mixed heat pump water loop supply temperature for alternatives 2 and 4. Here you can see the energy sharing via drift temperatures between setpoints.

The hourly condenser loads .csv files are saved here: P:\Projects\22110\Energy Model\HVAC Control checks\Condenser loads. Note the directory "with ventilation" for alternative 4 loads.

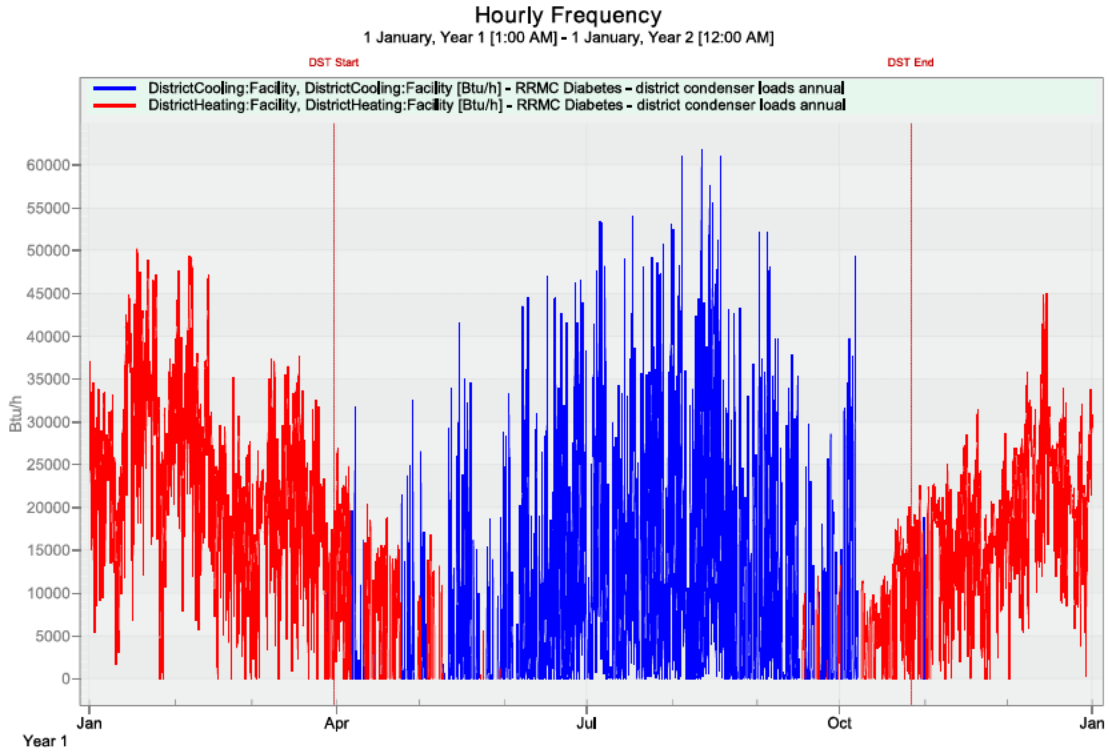

Figure 1 Condenser heating and cooling loads.

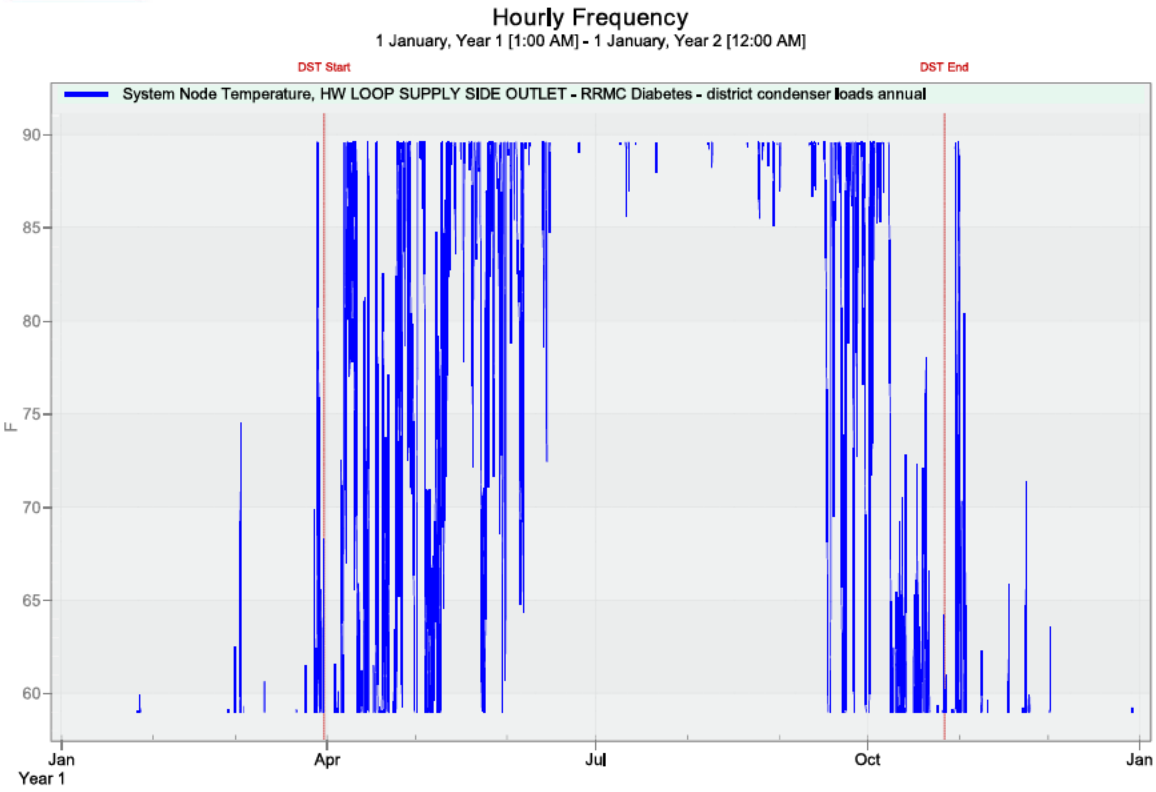

Figure 2 Conden er mixed water upply temperature

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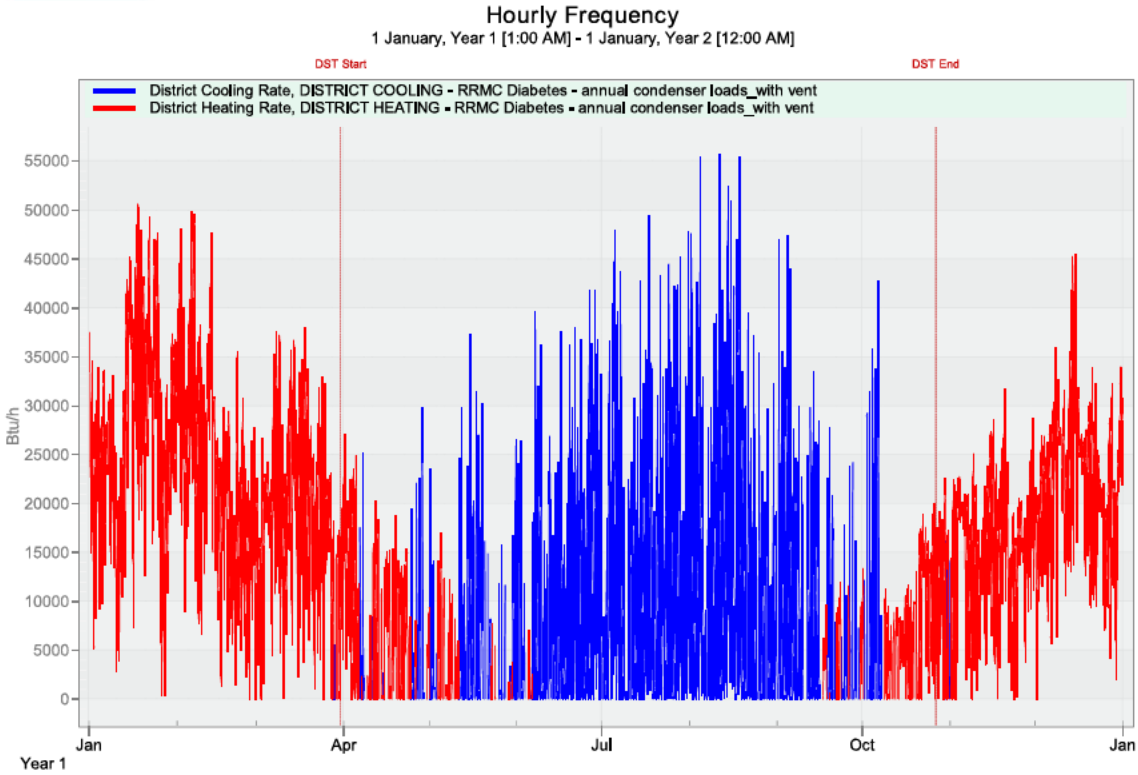

Figure 3 Condenser heating and cooling loads with ventilation. No zone setbacks.

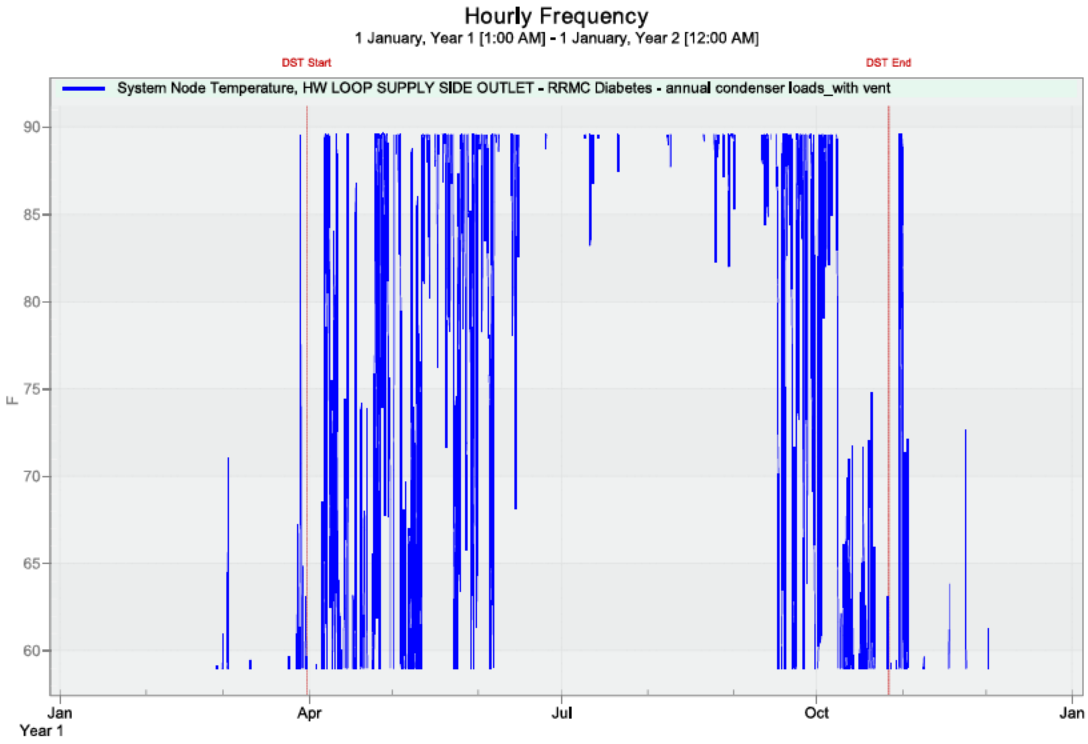

Figure 4 Conden er mixed water upply temperature with ventilation

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Figure 5 through Figure 7 show the results from alternative 2, an actual proposed default ground heat exchanger. The size of the GHX modeled is 12-boreholes of vertical U-tube type, 76m deep. The flow rate is 30 GPM. This was calculated from the zone heating and cooling loads. The maximum of heating and cooling design capacity of each zone was totaled, and a flow rate of 3 GPM/ton was used. The heat transfer rate is closely correlated with Figure 1 and the outlet temperature is within a good range. The mass flow rate peaks in the summer below the design rate of 30 GPM of water.

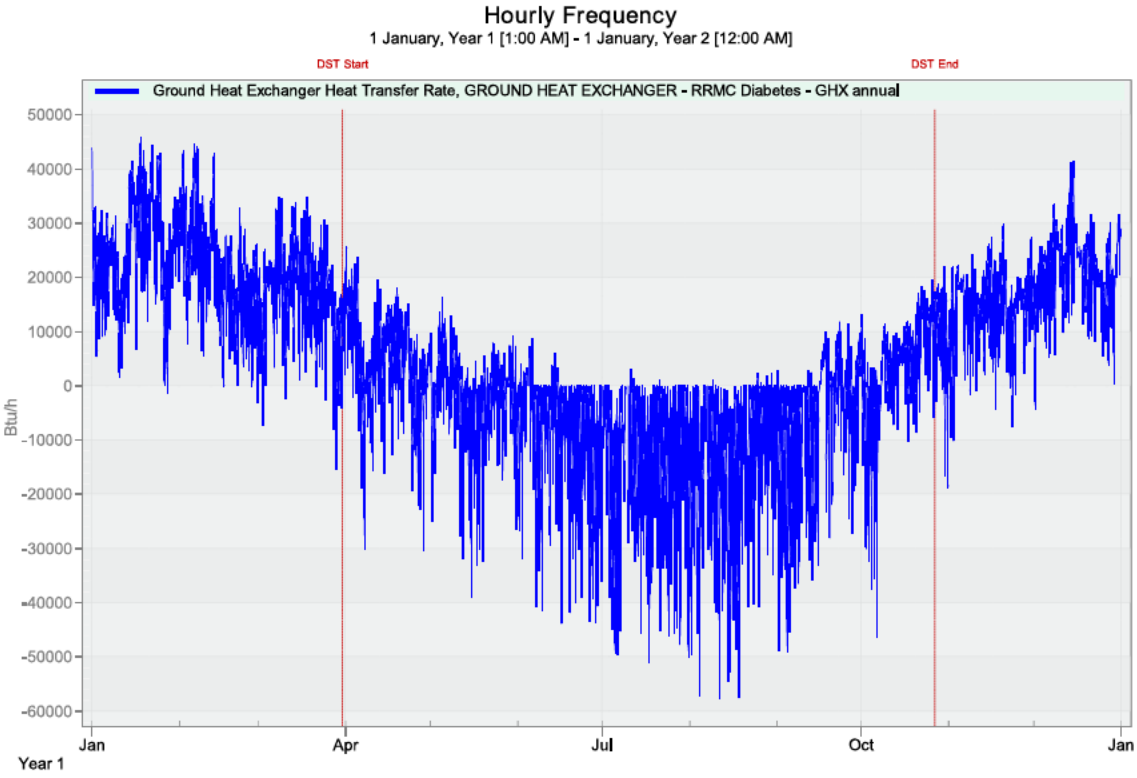

Figure 5 Ground heat exchanger heat transfer rate. Alternative 2.

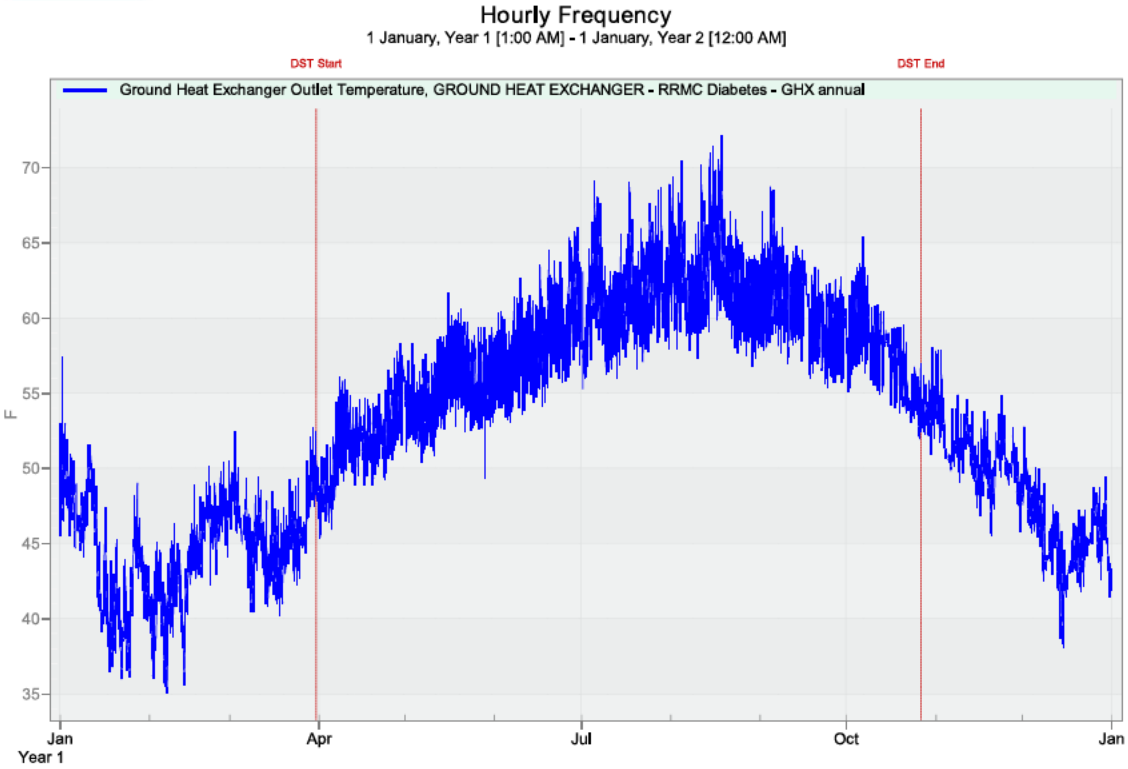

Figure 6 Ground heat exchanger outlet temperature Alternative 2

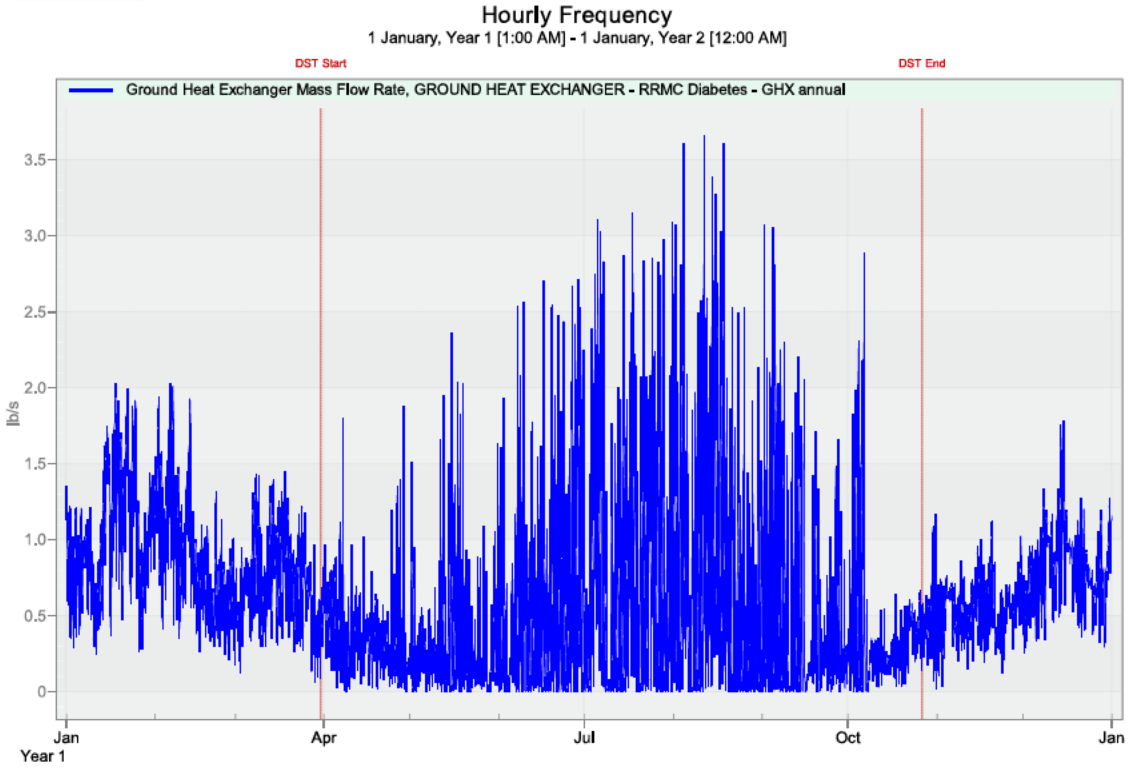

Figure 7 GHX mass flow rate. Alternative 2.

Figure 8 through Figure 10 show the results for alternative 3, the same ground heat exchanger with the zone temperature control change of added setbacks. The heating setpoint/setback for these graphs are 70F/60F and the cooling setpoint/setback is 75F/80F. Notice the large increase in heating peak loads above 80 kBtu/h. The cooling peaks are slightly larger than results shown in Figure 5. The mass flow rate is all the way up near design on multiple occasions, as seen in Figure 10.

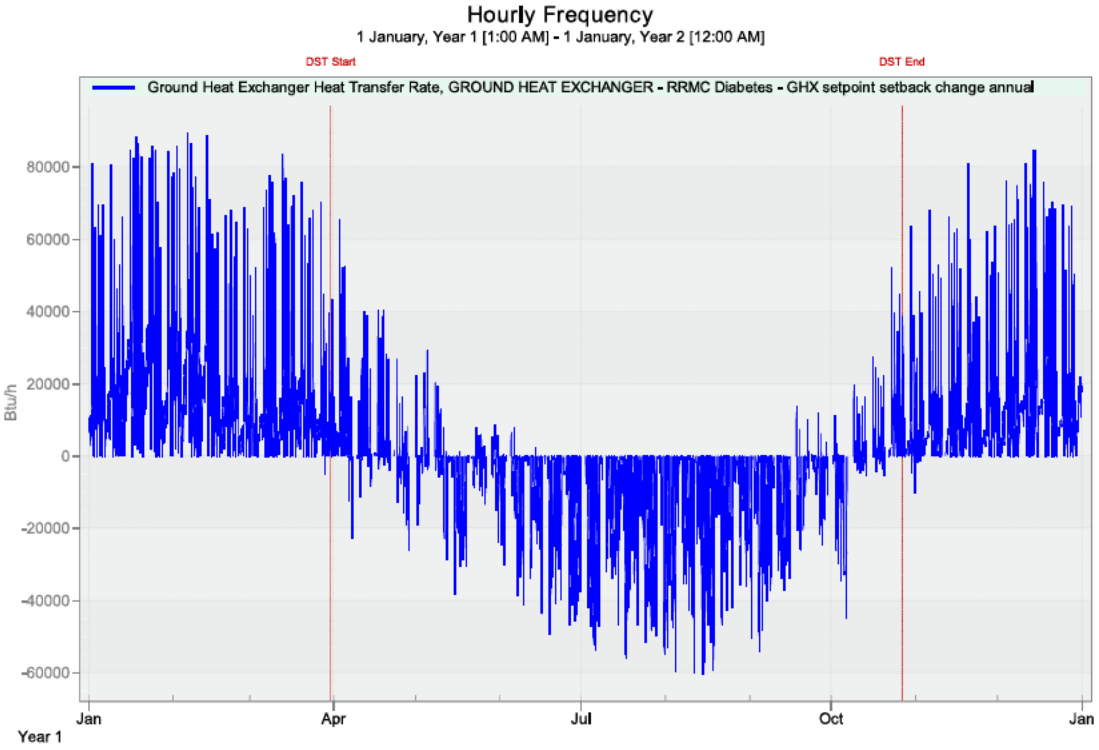

Figure 8 GHX heat tran fer rate Alternative 3: thermostat etbacks

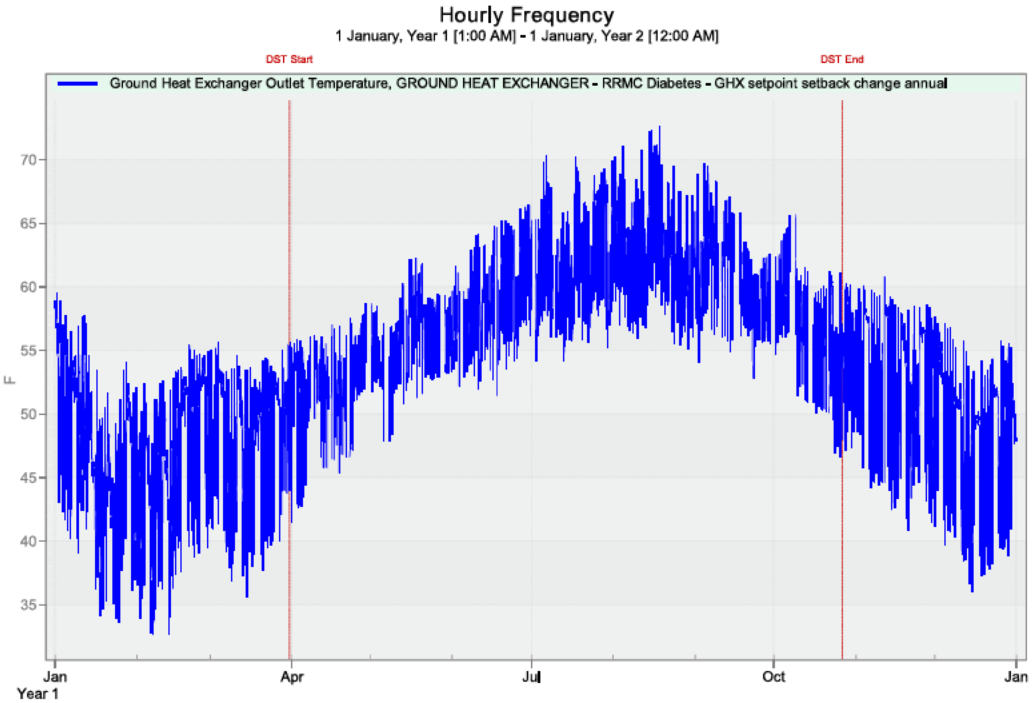

Figure 9 GHX outlet temperatu e Alternative 3: thermo tat etbacks

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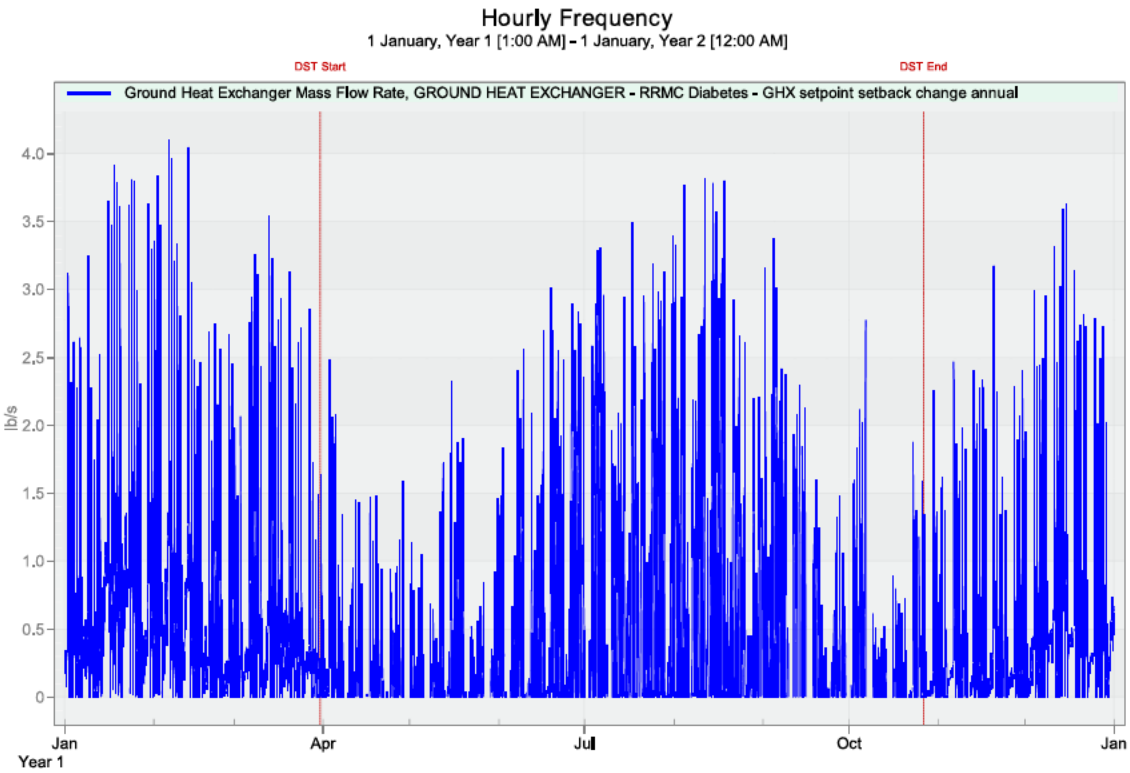

Figure 10 GHX mass flow rate. Alternative 3: thermostat setbacks.

Figure 11 through Figure 13 show the ground heat exchanger heat transfer rate, outlet temperature, and mass flow rate for alternative 4. Alternative 4 includes the addition of ventilation and temperature setbacks.

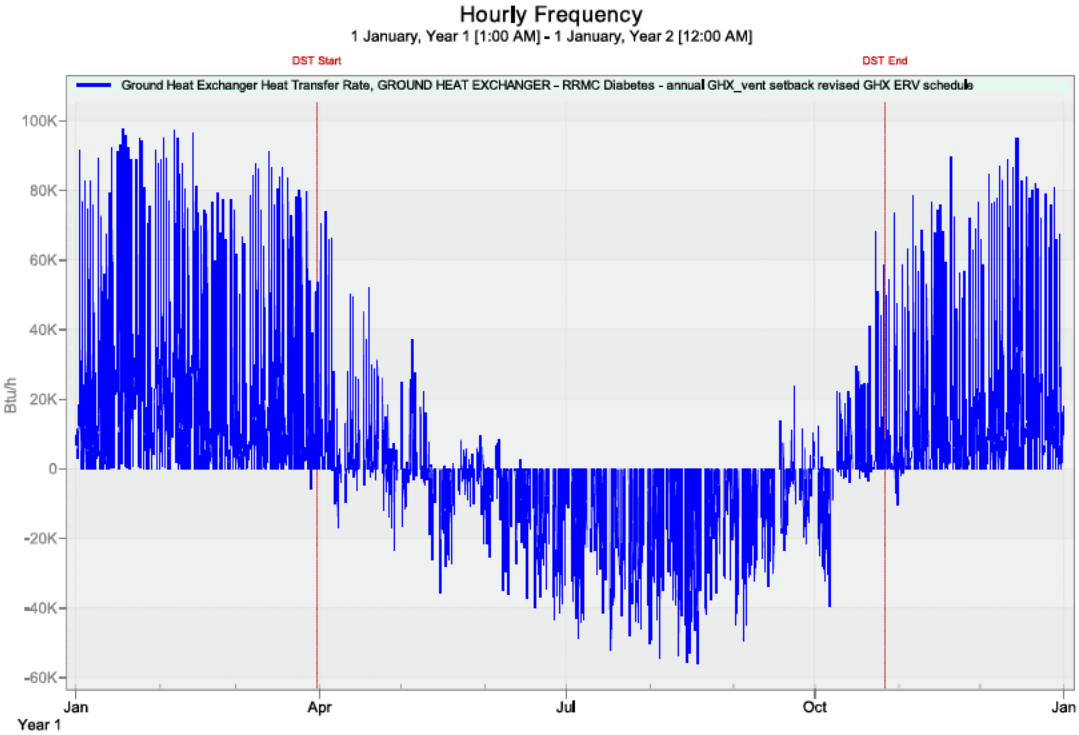

Figure 11 GHX heat tran fer rate Alternative 4: ventilation and thermo tat e backs

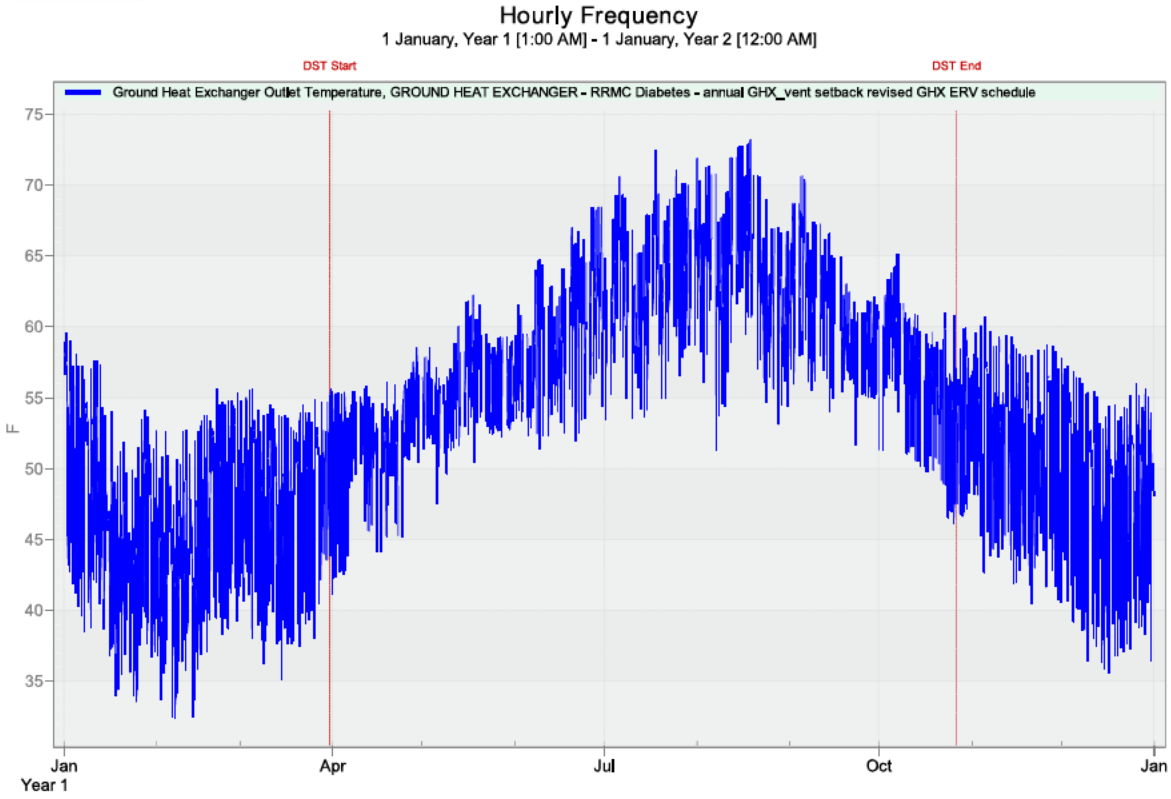

Figure 12 GHX outlet temperature. Alternative 4: ventilation and thermo tat e backs.

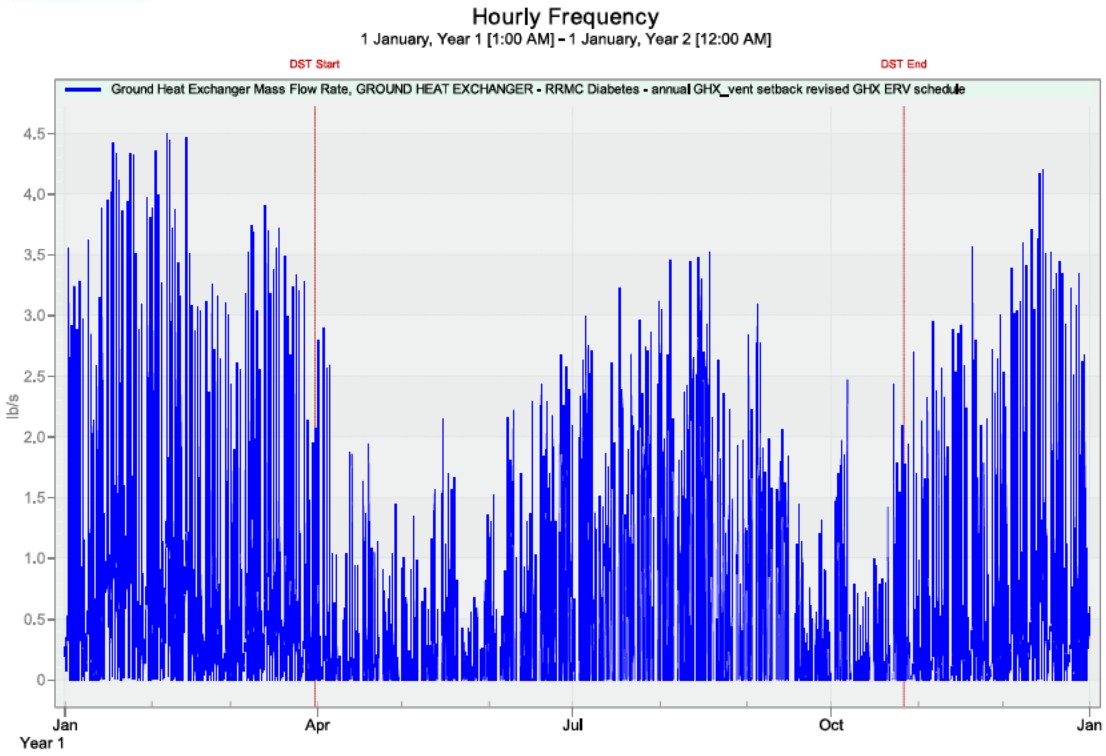

Figure 13 GHX mass flow rate. Alternative 4: ventilation and thermostat setbacks.

Table 2 shows the results energy end use comparison between four alternatives.

The energyplus annual summary reports can be found here: P:\Projects\22110\Energy Model\energyplus annual summary reports. This html file contains useful report information such as:

- Annual building utility performance summary
- Climatic data summary
- Envelope summary
- Lighting summary
- Equipment summary
- System summary
- Standard 62.1 summary

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Table 2 Al erna ive comparison end u e ummary

	alternative 1 existing system			alternative 2 Proposed GHX			alternative 3 Proposed GHX - with setpoint and setback			alternative 4 Proposed GHX - with vent and setback		
	Electricity [kBtu]	Propane [kBtu]	Water [gal]	Electricity [kBtu]	Propane [kBtu]	Water [gal]	Electricity [kBtu]	Propane [kBtu]	Water [gal]	Electricity [kBtu]	Propane [kBtu]	Water [gal]
Heating	42211.71	101451.3	0	48435.92	0	0	32617.97	0	0	34085.78	0	0
Cooling	10579.05	0	0	7905.58	0	0	6053.32	0	0	8165.13	0	0
Interior Lighting	14166.98	0	0	14166.98	0	0	14166.98	0	0	14166.98	0	0
Exterior Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Interior Equipment	30861.85	0	0	30861.85	0	0	30861.85	0	0	30861.85	0	0
Exterior Equipment	0	0	0	0	0	0	0	0	0	0	0	0
Fans	588.66	0	0	643.15	0	0	443.29	0	0	3323.29	0	0
Pumps	2531.53	0	0	256.79	0	0	192.95	0	0	196.81	0	0
Heat Rejection	372.3	0	0	0	0	0	0	0	0	0	0	0
Humidification	0	0	0	0	0	0	0	0	0	0	0	0
Heat Recovery	0	0	0	0	0	0	0	0	0	0	0	0
Water Systems	0	15266.65	20168	0	15266.65	20168	0	15269.04	20168	0	23477.63	30641.53
Refrigeration	0	0	0	0	0	0	0	0	0	0	0	0
Generators	0	0	0	0	0	0	0	0	0	0	0	0
Total End Uses	101312.08	116717.95	20168	102270.27	15266.65	20168	84336.36	15269.04	20168	90799.83	23477.63	30641.53
Total consumption (kBtu)	218030.03			117536.92			99605.4			114277.5		
Energy Use Improvement (relative change)	0%			46%			54%			48%		

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Existing Conditions

The existing building envelope and HVAC system was determined by the following sources of information:

- Zero by Degrees report called, *RRMC 12-21-16 Blower Door Test,* saved here: P:\Projects\16106\Envelope Report.
- LN Consulting project #16106
    - Mechanical demo plan sheets M0.1 and M0.2. This project was not finished and not constructed. The demolition plans showed the existing equipment
    - Field work photos

Table 3 shows the calibrated existing building envelope R-values. More discussion about the calibration effort is in section Calibration methods of the Appendix.

Table 3 Existing building modeled envelope summary.

	RRMC - Diabetes; R-values						
alternative	Exterior walls	below grade walls	pitched roof	ground floor	internal (attic) floor	windows	Infiltration (CFM@50Pa)
existing conditions	19.7*	NA	16.8**	2.6***	4.8****	2.1	3798*****

*Calibration effort sent this wall R-value down
**Calibration effort reduced polyiso thickness to 3"
***slab also includes 1.5" EPS interior vertical perimeter insulation
****Modeled internal floor (attic) assembly from inner to outer surface = OSB - 10" air gap - ceiling tiles
*****Added additional infiltration to account for exhaust fans

HVAC system descriptions

Alternative 1: Existing system

Figure 14 is the modeled HVAC system schematic. The mixed water loop is the combination of a condenser loop and hot water loop, joined via fluid-fluid heat exchanger. The system consists of the following components:

- Condenser loop
  - Constant flow condenser loop with max loop temp of 122F and minimum 41F and design loop exit temperature of 84F with 9F delta T.
  - Autosized maximum water flow rate
  - Setpoint manager type – follow outdoor air temperature (reference wetbulb) minimum setpoint temp of 50F, maximum 122F (wetbulb)
  - Fluid Cooler
    - Single speed
- Hot water loop
  - constant flow water hot water loop with a max loop temp of 180F and minimum 50F and design loop exit temperature of 86F with 10F delta T
  - Autosized maximum water flow rate
  - Dual setpoint deadband with sequential load distribution scheme.
    - Low heating setpoint of 66F and high cooling setpoint of 90F.
  - Boiler
    - Propane noncondensing, non-modulated with nominal thermal efficiency of 80%
- No heat exchanger
- Domestic Hot water loop
  - Variable flow with max temp of 140F and min temp 32F and design loop exit temperature of 133F with a 9F delta T.
  - Setpoint manager – temperature control to 131F
  - DHW loop water heater
    - Mixed tank type
    - Propane heater fuel
    - Located inside with ambient temp of 20C at all times.
- Zone Water Source Heat Pumps
  - Water to air heat pump
  - Cycling fan and cycling water flow
  - Heating design supply air temp = 100F
  - Cooling design supply air temp = 53F
  - Heating effectiveness = 0.8

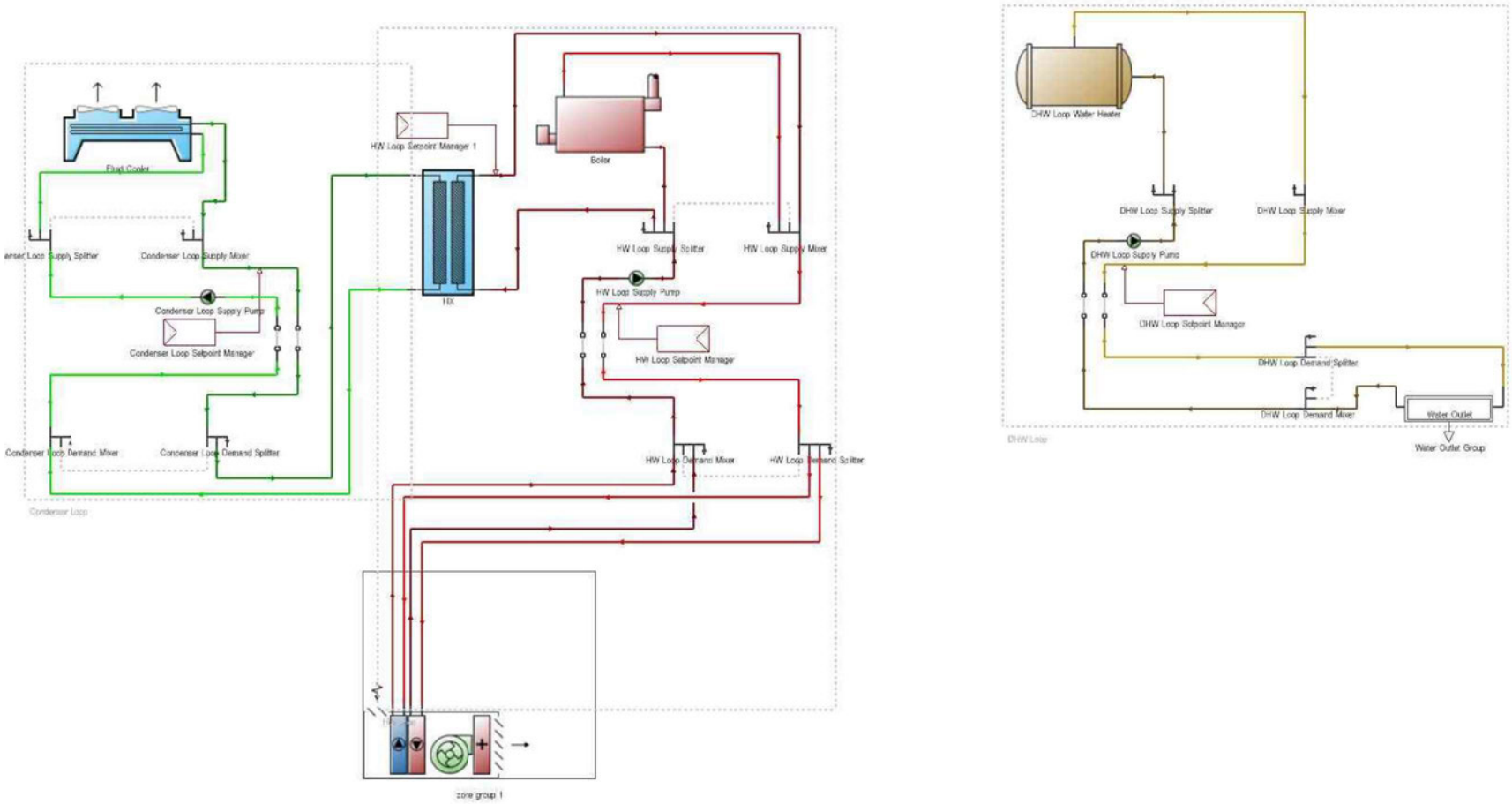

Figure 14 Existing HVAC system schematic

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Alternative 2 and 3: Proposed ground heat exchanger

- Condenser loop
    - Variable flow water condenser loop with max loop temp of 122F and minimum 41F and design loop exit temperature of 84F with 9F delta T.
    - 30 GPM maximum water flow rate
    - Setpoint manager type – follow ground temperature minimum setpoint temp of 50F, maximum 122F. Reference ground temperature is "deep ground"
    - Ground heat exchanger
        - Quantity (12) vertical U-Tube boreholes, each 76m deep
        - Default ground properties and G-function
        - 30 GPM design flow rate
- Domestic Hot water loop
    - Variable flow with max temp of 176F and min temp 32F and design loop exit temperature of 133F with a 9F delta T.
    - Setpoint manager – temperature control to 131F
    - DHW loop water heater
        - Mixed tank type
        - Propane heater fuel
        - Located inside with ambient temp of 20C at all times.
- Zone Water Source Heat Pumps
    - Water to air heat pump
    - Cycling fan and cycling water flow
    - Heating design supply air temp = 100F
    - Cooling design supply air temp = 53F
    - Heating effectiveness = 0.8

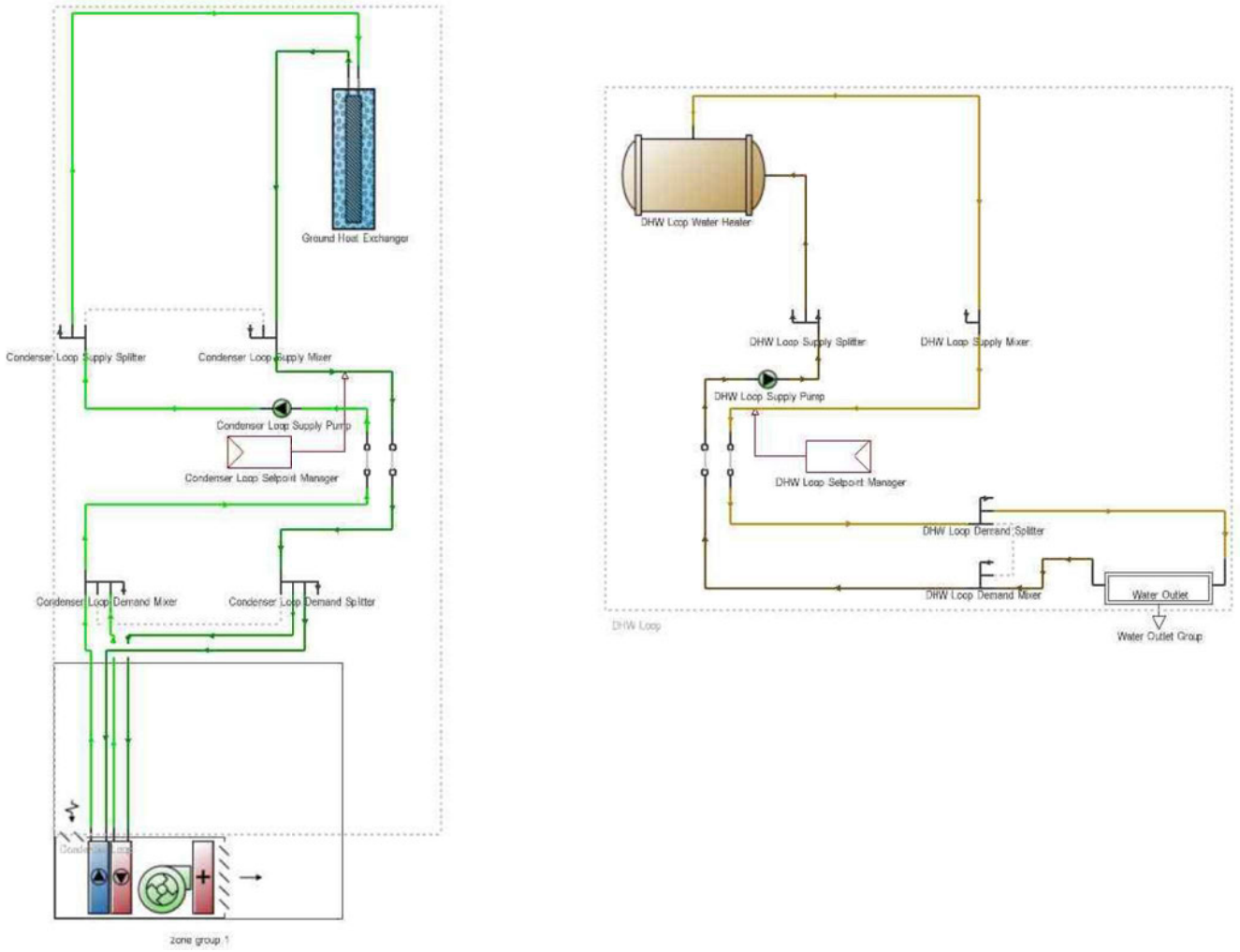

Figure 15 Proposed HVAC system schematic

Alternative 4: Proposed ground heat exchanger with central ERV

- Condenser loop
  - Variable flow water condenser loop with max loop temp of 122F and minimum 41F and design loop exit temperature of 84F with 9F delta T.
  - 33 GPM maximum water flow rate
  - Setpoint manager type – follow ground temperature minimum setpoint temp of 50F, maximum 122F. Reference ground temperature is "deep ground"
  - Ground heat exchanger
    - Quantity (12) vertical U-Tube boreholes, each 76m deep
    - Default ground properties and G-function
    - 33 GPM design flow rate
- Central ERV
  - Sized on coincident ventilation requirement
  - DX cooling coil with desuperheater (30% reclaim efficiency)
  - Heat recovery: winter sensible/latent effectiveness = 91%/60%. Summer sensible/latent effectiveness = 75%/52%
  - Multi zone humidity maximum control
  - OA supply air temperature control = 73F
  - Availability: Monday – Friday; 7a-6p. Off for the weekends.
- Domestic Hot water loop
  - Variable flow with max temp of 176F and min temp 32F and design loop exit temperature of 133F with a 9F delta T.
  - Setpoint manager – temperature control to 131F
  - DHW loop water heater
    - Mixed tank type
    - Propane heater fuel
    - Located inside with ambient temp of 20C at all times.
- Zone Water Source Heat Pumps
  - Water to air heat pump
  - Cycling fan and cycling water flow
  - Heating design supply air temp = 100F
  - Cooling design supply air temp = 53F
  - Heating effectiveness = 0.8

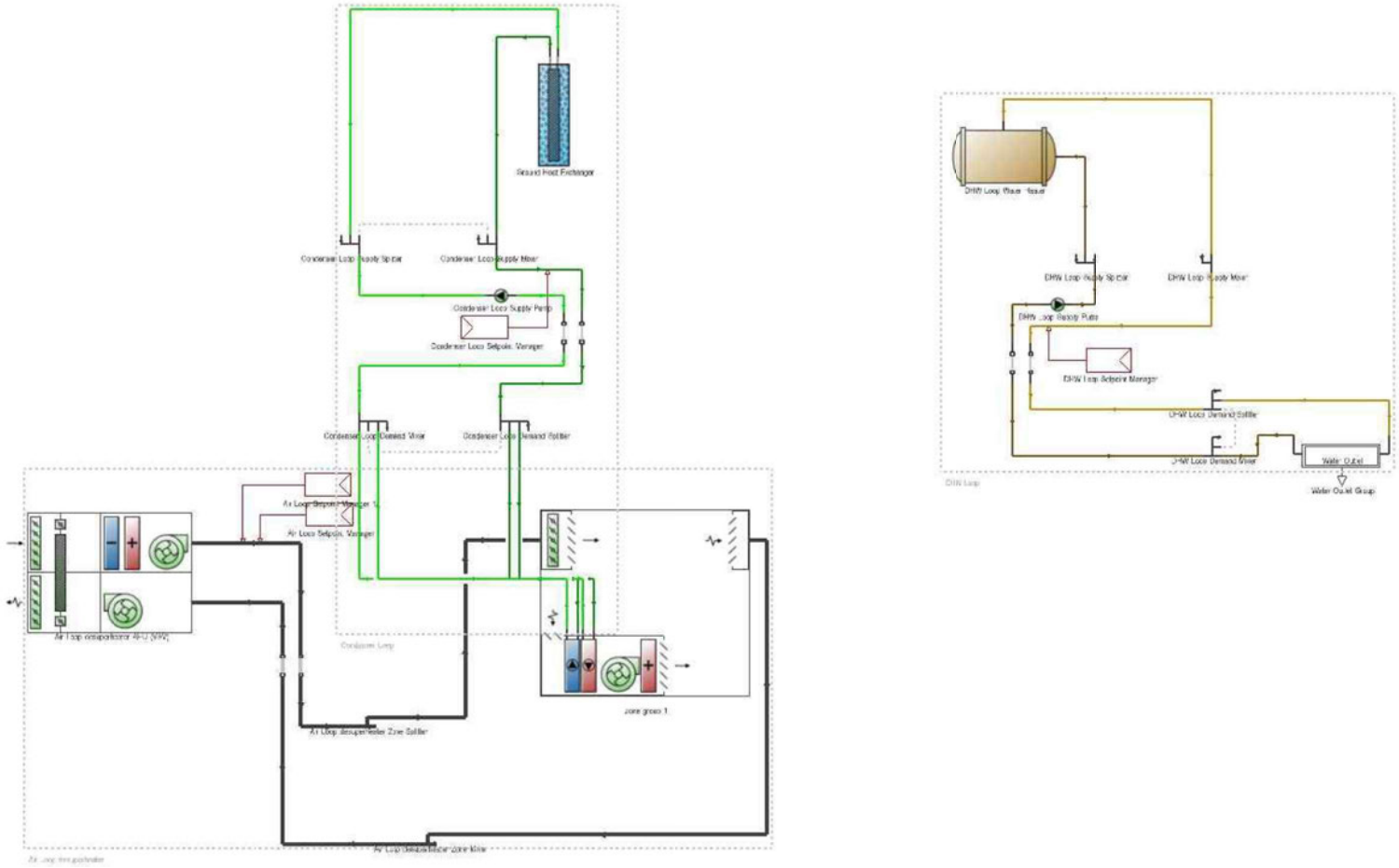

Figure 16 Alternative 4 HVAC schematic. Ground heat exchanger with central ERV.

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Energy Model Renderings

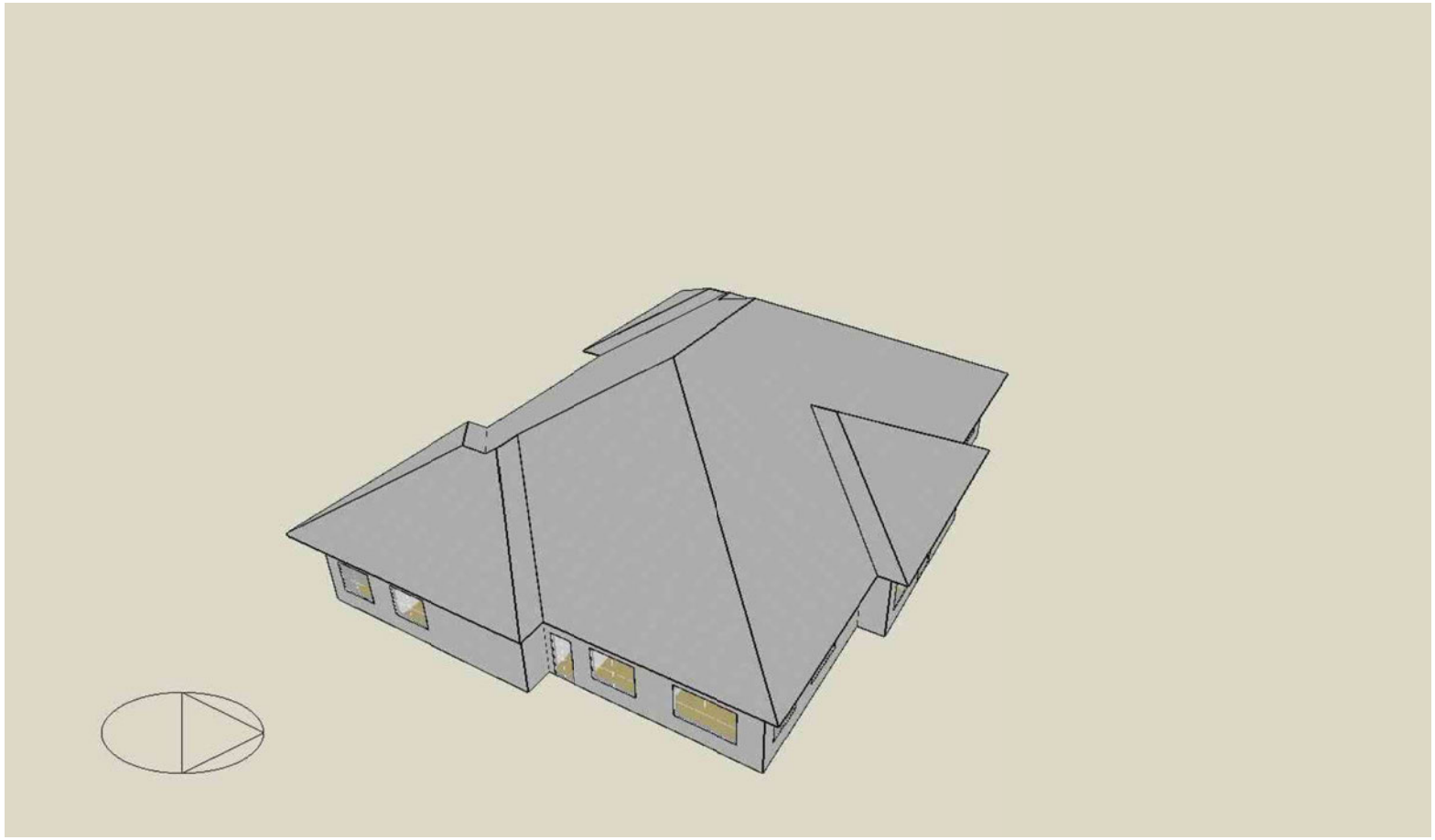

Figure 17 axonometric view

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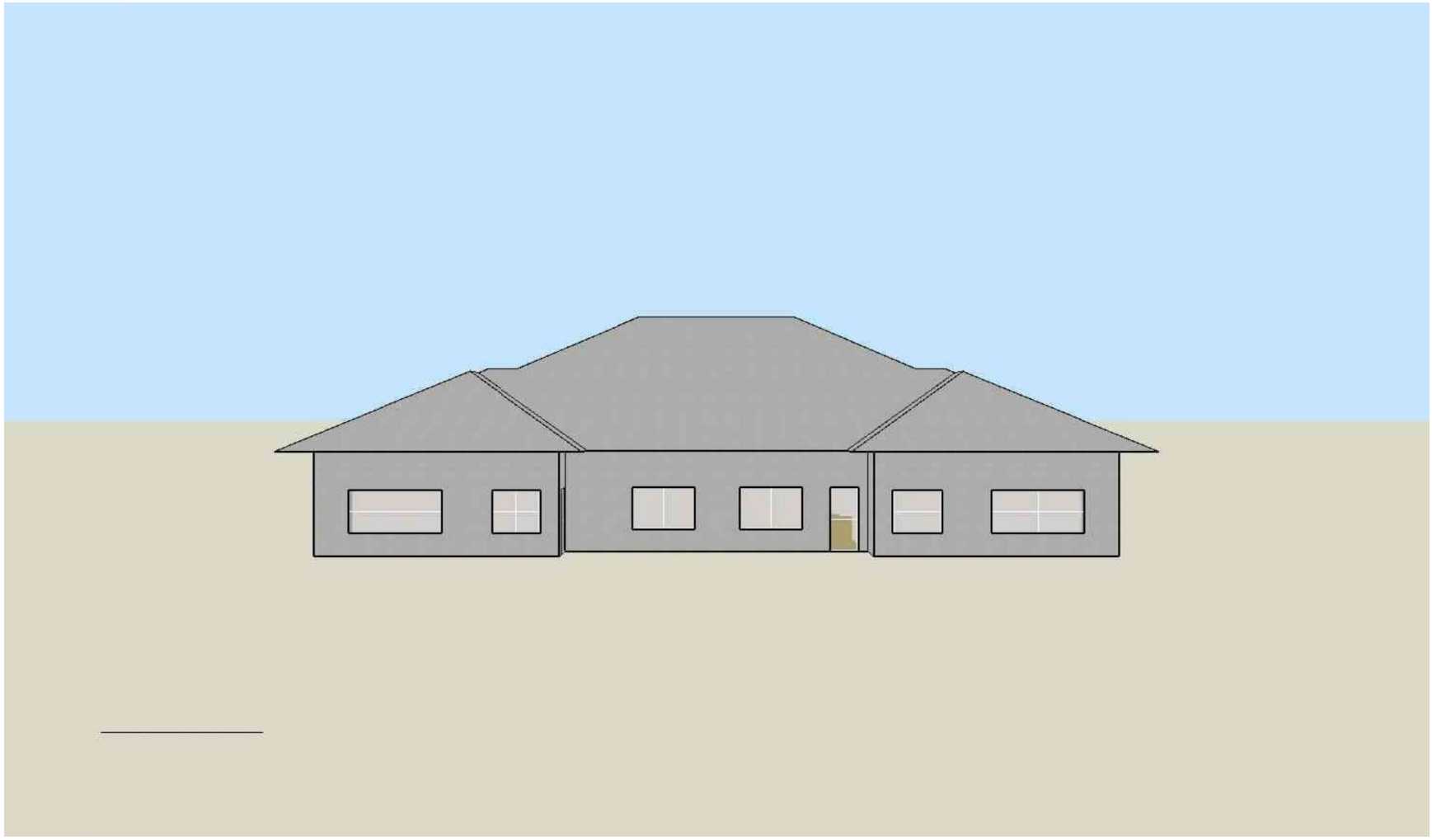

Figure 18 ba k view

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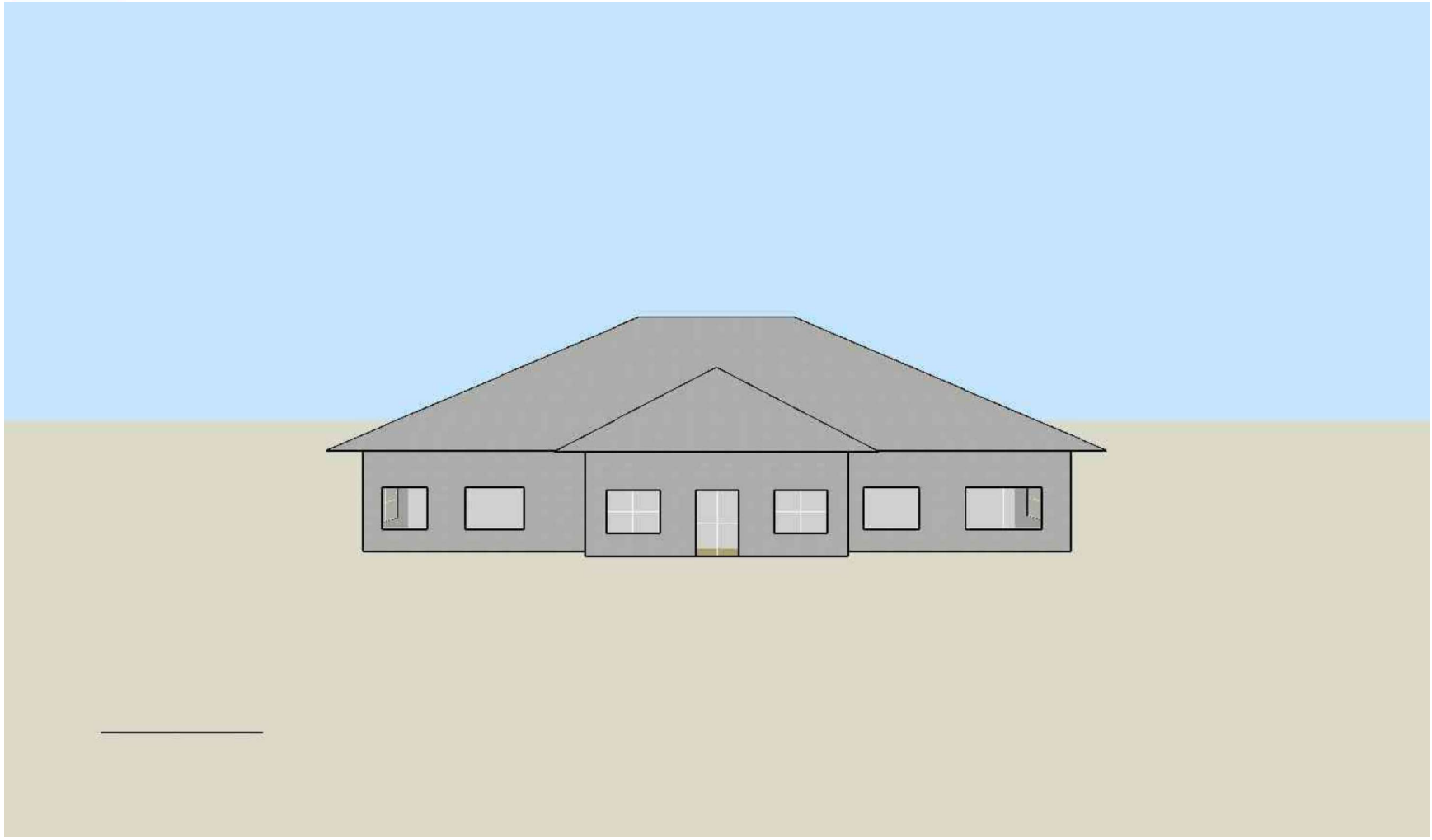

Figure 19 fron vi w.

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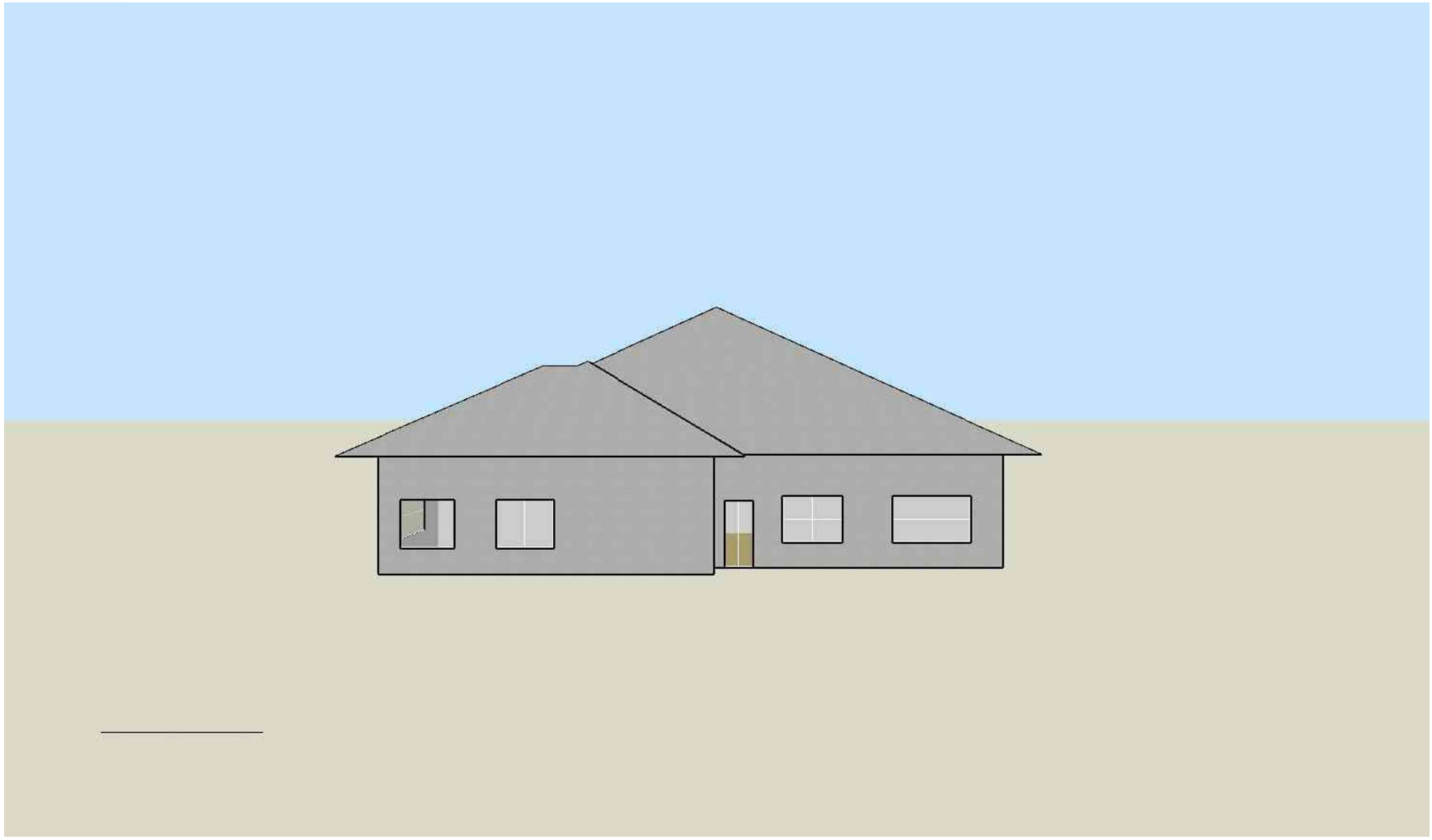

Figure 20 lef vi w.

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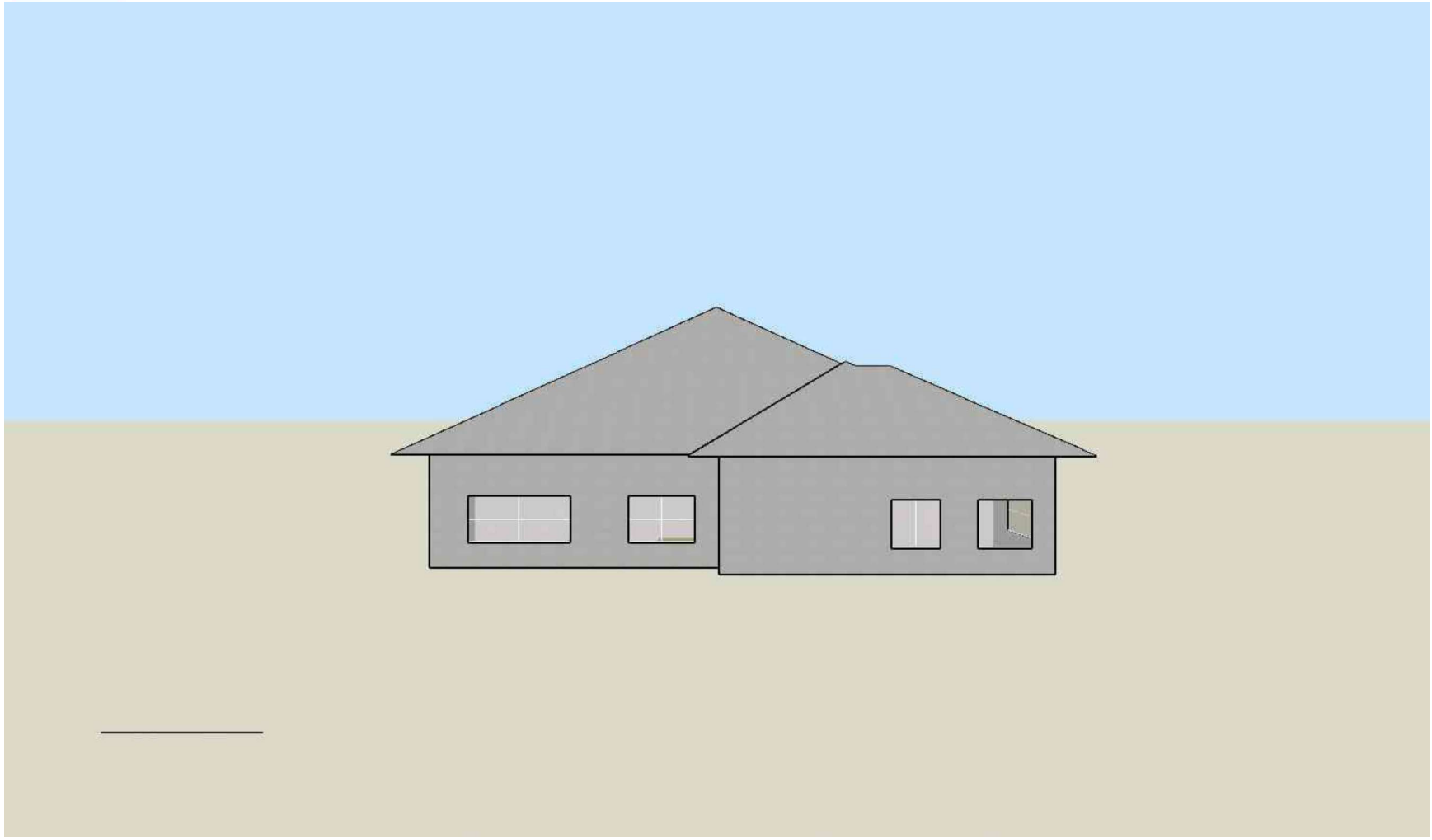

Figure 21 righ vi w.

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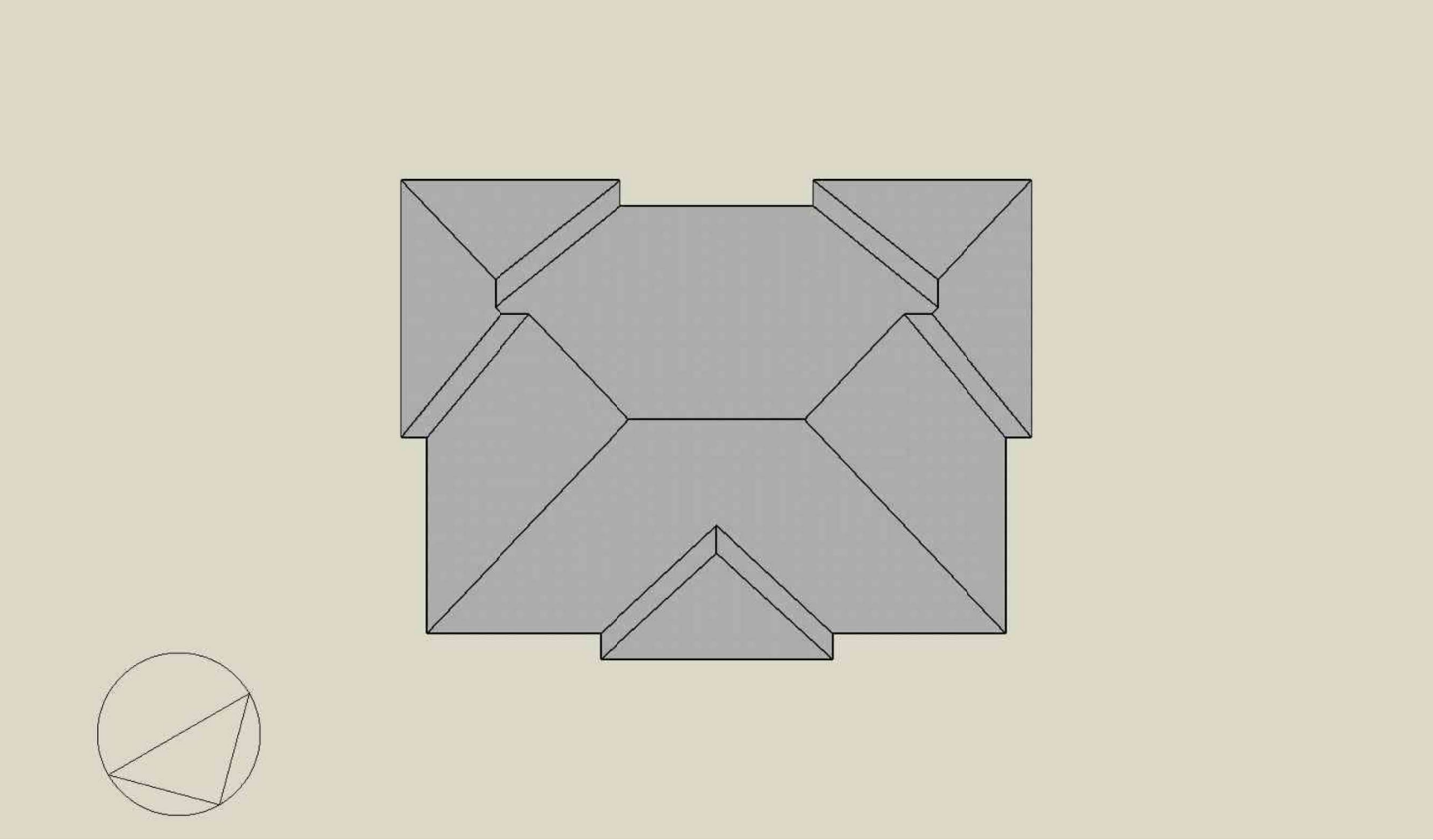

Figure 22 Pl n view

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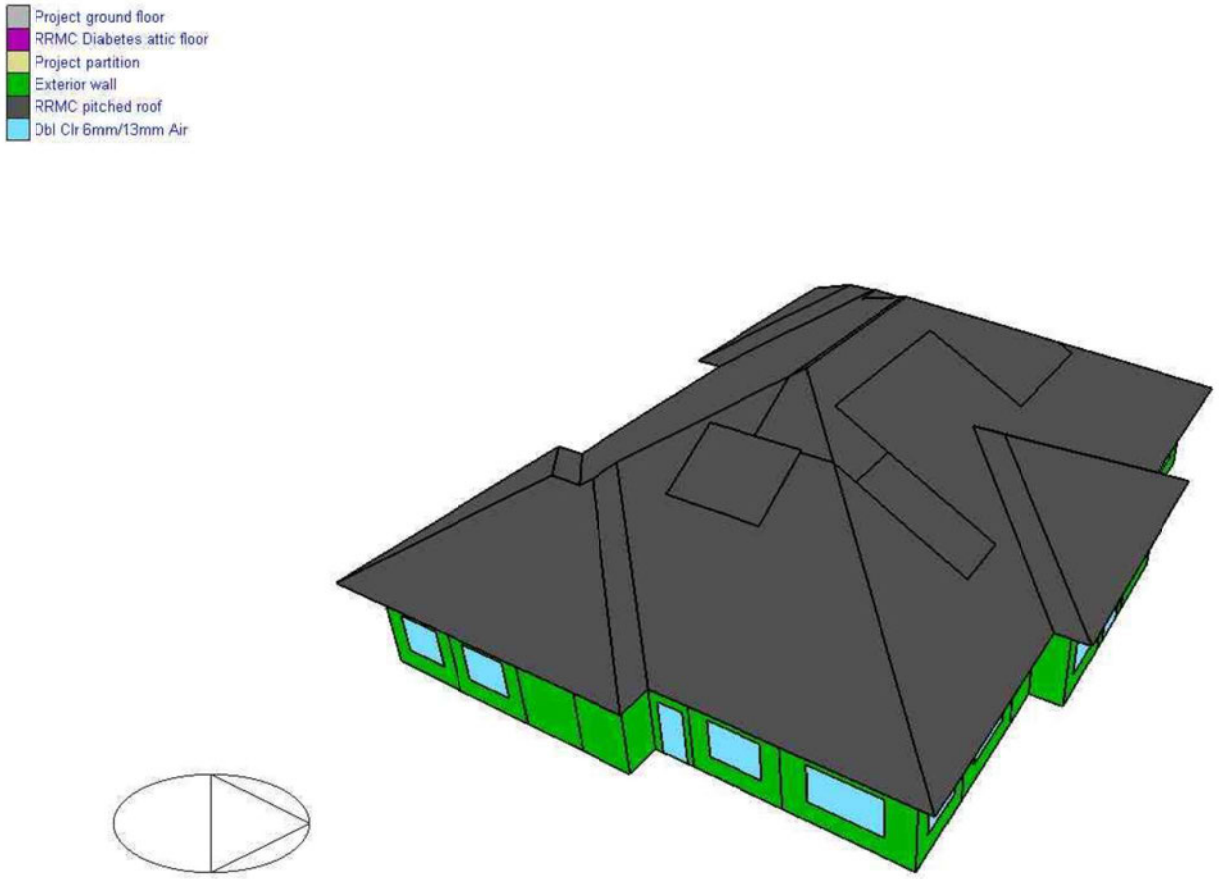

Figure 23 Model data axonometric view.

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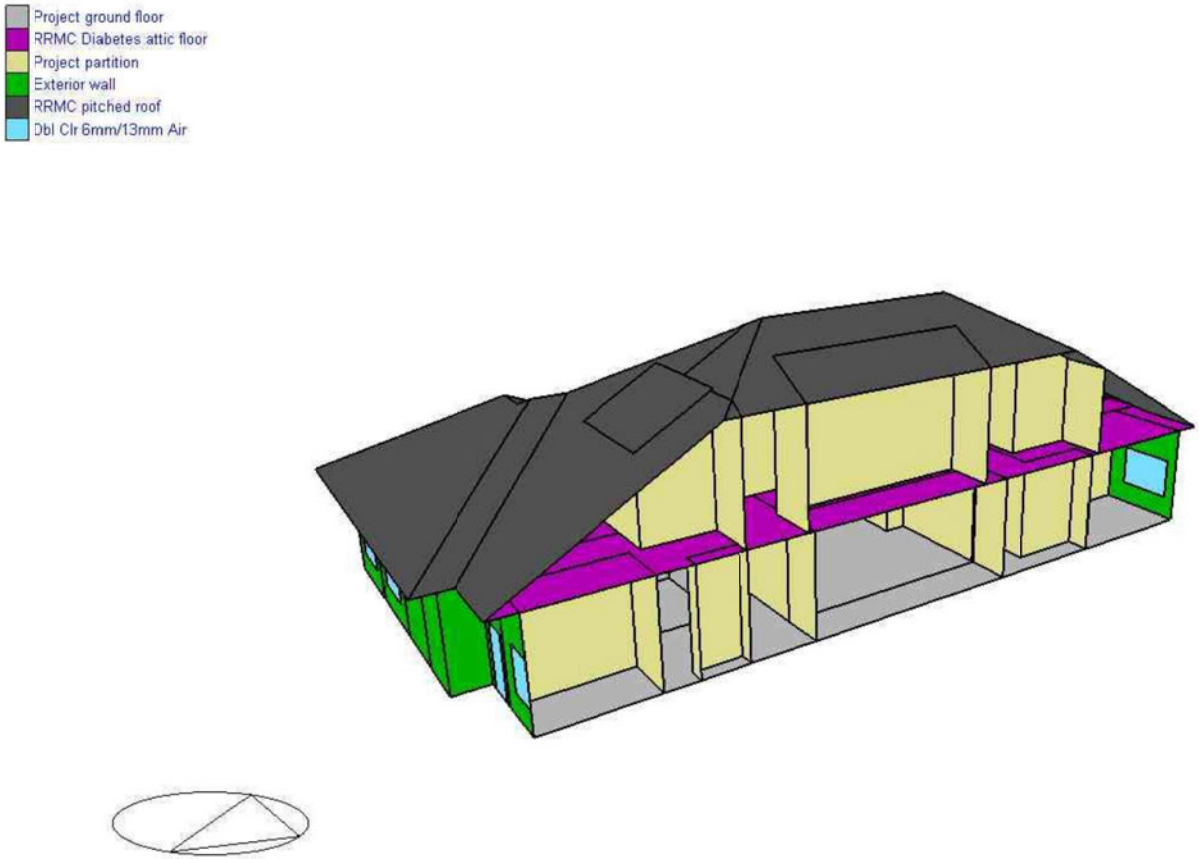

Figure 24 model data section view.

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Floor plan and zoning

The model reflects the floor plans provided by dore and wittier, located here: P:\Projects\21185\Drawings\Arch.

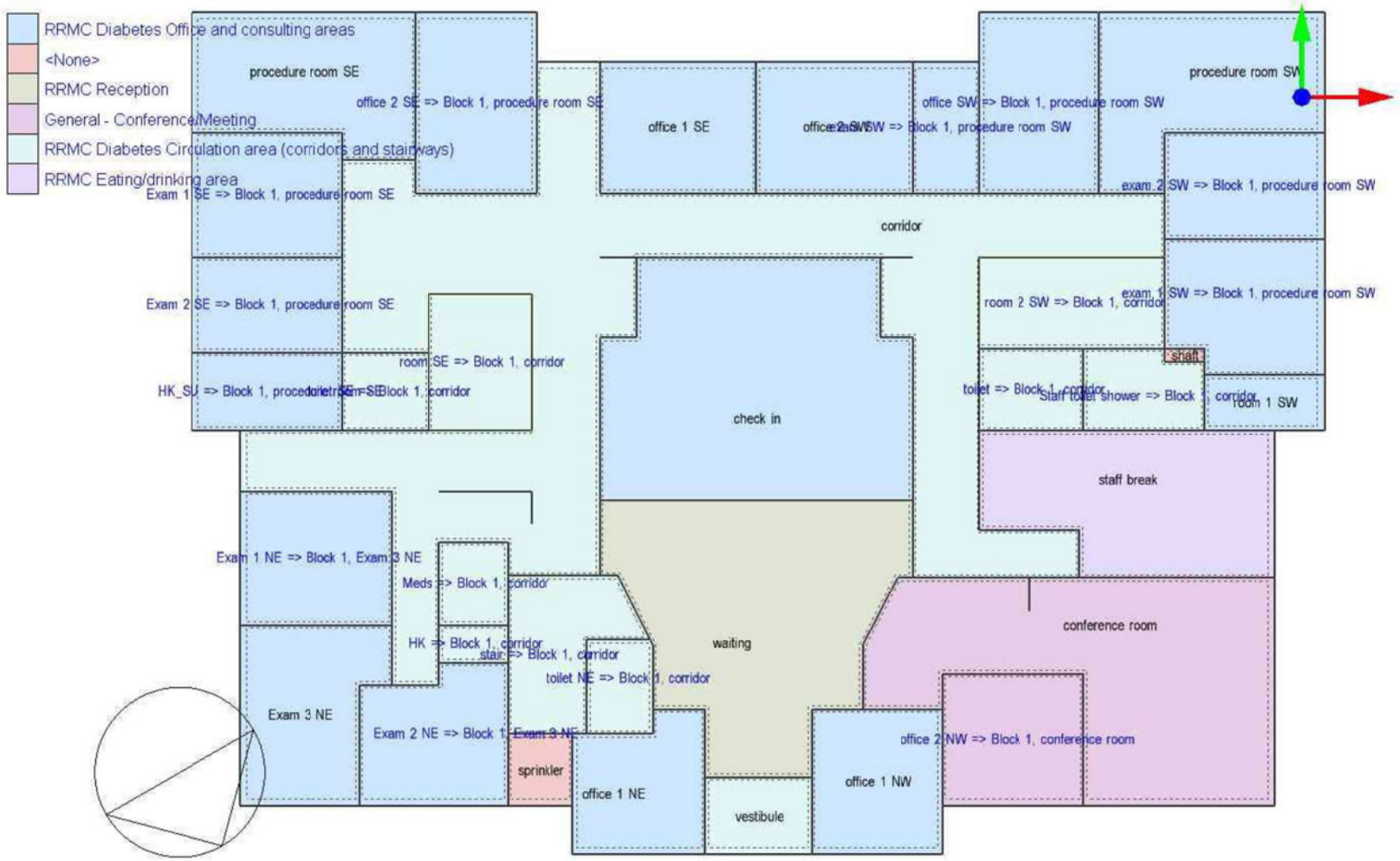

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Figure 25 Ground floor zoning.

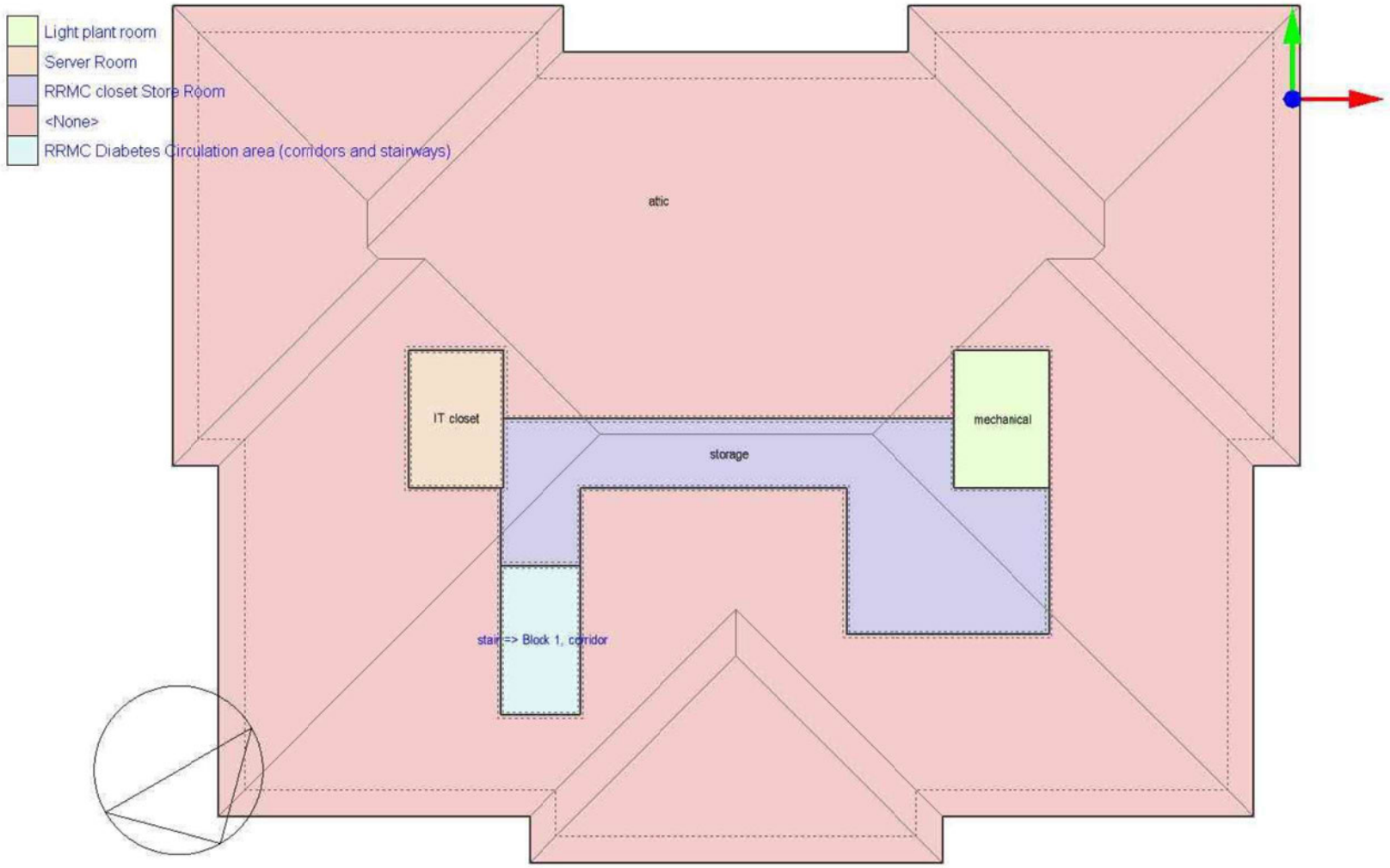

Figure 26 Attic zoning.

Appendix

Load Results

Alternative 1: existing conditions

Figure 27 is the total building heating design heat balance. The bottom-line number, *zone sensible heating*, is the total load on all heating components in the building.

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Temperature and Heat Loss

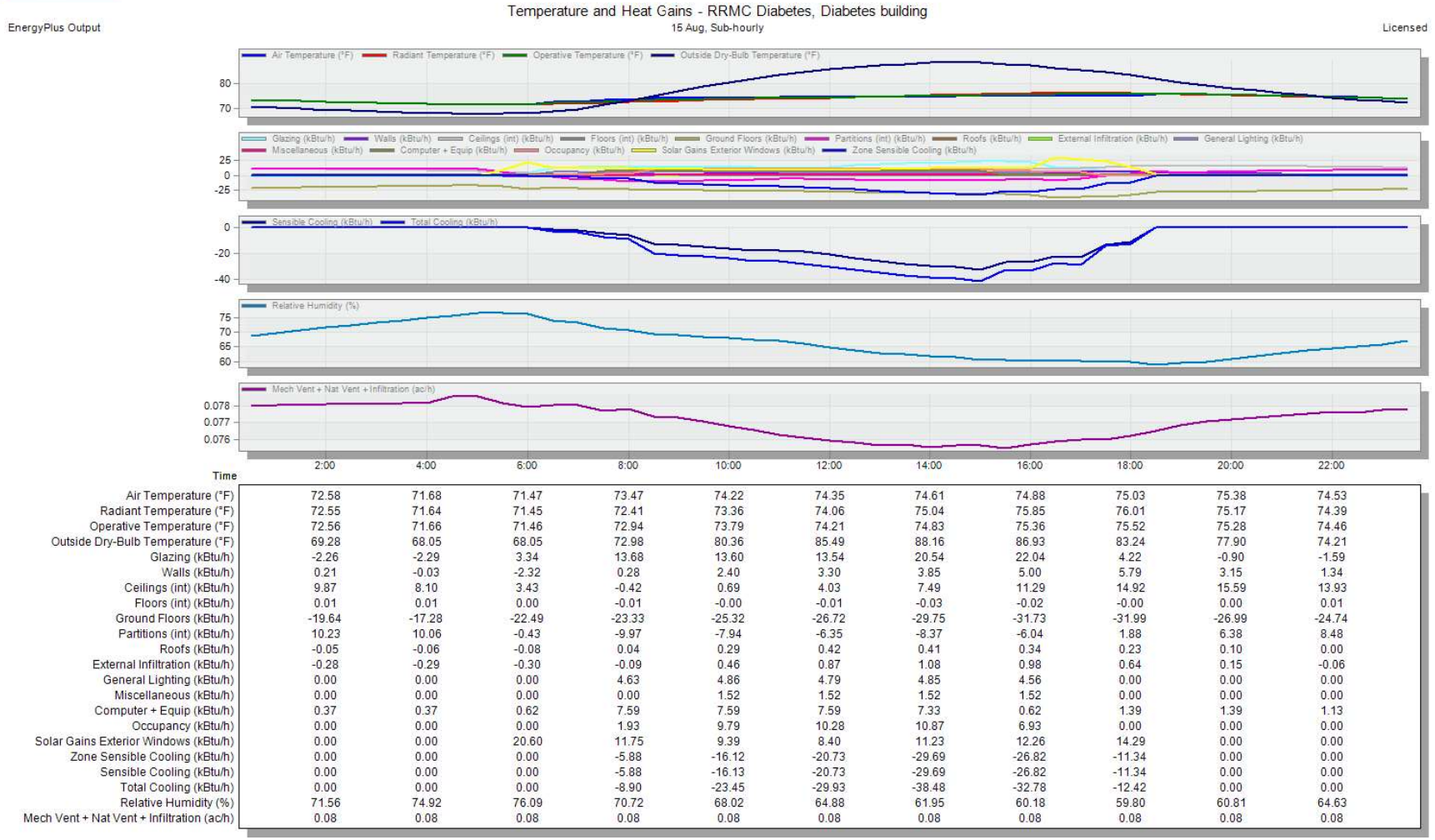
EnergyPlus Output

Licensed

Air Temperature (°F)	71.85
Radiant Temperature (°F)	65.14
Operative Temperature (°F)	68.50
Outside Dry-Bulb Temperature (°F)	-6.88
Glazing (kBtu/h)	-21.85
Walls (kBtu/h)	-11.85
Ceilings (int) (kBtu/h)	-38.80
Floors (int) (kBtu/h)	0.01
Ground Floors (kBtu/h)	-4.83
Partitions (int) (kBtu/h)	-3.81
Roofs (kBtu/h)	-0.51
External Infiltration (kBtu/h)	-7.77
Zone Sensible Heating (kBtu/h)	89.45

Figure 27 alternative 1 heating design heat balance. This is the total building load.

Figure 28 is the total building cooling design heat balance.



Time	2:00	4:00	6:00	8:00	10:00	12:00	14:00	16:00	18:00	20:00	22:00
Air Temperature (°F)	72.58	71.68	71.47	73.47	74.22	74.35	74.61	74.88	75.03	75.38	74.53
Radiant Temperature (°F)	72.55	71.64	71.45	72.41	73.36	74.06	75.04	75.85	76.01	75.17	74.39
Operative Temperature (°F)	72.56	71.66	71.46	72.94	73.79	74.21	74.83	75.36	75.52	75.28	74.46
Outside Dry-Bulb Temperature (°F)	69.28	68.05	68.05	72.98	80.36	85.49	88.16	86.93	83.24	77.90	74.21
Glazing (kBtu/h)	-2.26	-2.29	3.34	13.68	13.60	13.54	20.54	22.04	4.22	-0.90	-1.59
Walls (kBtu/h)	0.21	-0.03	-2.32	0.28	2.40	3.30	3.85	5.00	5.79	3.15	1.34
Ceilings (int) (kBtu/h)	9.87	8.10	3.43	-0.42	0.69	4.03	7.49	11.29	14.92	15.59	13.93
Floors (int) (kBtu/h)	0.01	0.01	0.00	-0.01	-0.00	-0.01	-0.03	-0.02	-0.00	0.00	0.01
Ground Floors (kBtu/h)	-19.64	-17.28	-22.49	-23.33	-25.32	-26.72	-29.75	-31.73	-31.99	-26.99	-24.74
Partitions (int) (kBtu/h)	10.23	10.06	-0.43	-9.97	-7.94	-6.35	-8.37	-6.04	1.88	6.38	8.48
Roofs (kBtu/h)	-0.05	-0.06	-0.08	0.04	0.29	0.42	0.41	0.34	0.23	0.10	0.00
External Infiltration (kBtu/h)	-0.28	-0.29	-0.30	-0.09	0.46	0.87	1.08	0.98	0.64	0.15	-0.06
General Lighting (kBtu/h)	0.00	0.00	0.00	4.63	4.86	4.79	4.85	4.56	0.00	0.00	0.00
Miscellaneous (kBtu/h)	0.00	0.00	0.00	0.00	1.52	1.52	1.52	1.52	0.00	0.00	0.00
Computer + Equip (kBtu/h)	0.37	0.37	0.62	7.59	7.59	7.59	7.33	0.62	1.39	1.39	1.13
Occupancy (kBtu/h)	0.00	0.00	0.00	1.93	9.79	10.28	10.87	6.93	0.00	0.00	0.00
Solar Gains Exterior Windows (kBtu/h)	0.00	0.00	20.60	11.75	9.39	8.40	11.23	12.26	14.29	0.00	0.00
Zone Sensible Cooling (kBtu/h)	0.00	0.00	0.00	-5.88	-16.12	-20.73	-29.69	-26.82	-11.34	0.00	0.00
Sensible Cooling (kBtu/h)	0.00	0.00	0.00	-5.88	-16.13	-20.73	-29.69	-26.82	-11.34	0.00	0.00
Total Cooling (kBtu/h)	0.00	0.00	0.00	-8.90	-23.45	-29.93	-38.48	-32.78	-12.42	0.00	0.00
Relative Humidity (%)	71.56	74.92	76.09	70.72	68.02	64.88	61.95	60.18	59.80	60.81	64.63
Mech Vent + Nat Vent + Infiltration (ac/h)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Figure 28 alternative 1 cooling design heat balance.

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Table 4 zone heat ng design oads A terna ive 1

Block	Zone	Comfort Temperature (°F)	Steady-State Heat Loss (kBtu/h)	Intermittent Heat Loss (kBtu/h)	Design Capacity (kBtu/h)	Design Capacity (Btu/h-ft2)	Glazing Gains (kBtu/h)	Wall Gains (kBtu/h)	Floor Gains (kBtu/h)	Roof and Ceiling Gains (kBtu/h)	Ventilation Gains (kBtu/h)	Infiltration Gains (kBtu/h)
Block 1	Exam 3 NE	67.93	9.41	0	11.76	32.0119	-3.668	-1.493	-0.191	-2.895	0	-1.162
Block 1	sprinkler	59.38	0	0	0	0	0	0.173	0.067	-0.167	0	-0.073
Block 1	office 1 NE	67.83	2.86	0	3.58	36.0136	-0.836	-0.829	-0.039	-0.797	0	-0.364
Block 1	waiting	68.7	3.67	0	4.59	11.8493	0	-0.412	-0.377	-2.882	0	0
Block 1	office 1 NW	67.9	2.86	0	3.57	32.2776	-0.826	-0.746	-0.049	-0.878	0	-0.36
Block 1	conference room	68.02	10.29	0	12.86	25.1772	-3.606	-1.445	-0.275	-3.84	0	-1.12
Block 1	corridor	69.23	20.58	0	25.73	16.3778	-1.242	-5.228	-2.207	-11.445	0	-0.463
Block 1	staff break	68.66	3.51	0	4.38	18.7785	-0.957	-0.342	-0.245	-1.767	0	-0.196
Block 1	check in	68.89	3.63	0	4.54	10.0948	0	0.12	-0.519	-3.231	0	0
Block 1	room 1 SW	69.15	1.04	0	1.3	37.3046	0	-0.453	-0.058	-0.321	0	-0.21
Block 1	procedure room SE	68.33	12.86	0	16.08	28.8517	-3.731	-2.444	-0.469	-4.472	0	-1.723
Block 1	office 1 SE	68.22	2.6	0	3.25	26.7797	-1.013	-0.326	-0.084	-0.964	0	-0.209
Block 1	office 2 SW	68.18	2.63	0	3.29	27.1204	-1.012	-0.365	-0.079	-0.962	0	-0.209
Block 1	procedure room SW	68.31	13.21	0	16.51	28.6009	-4.145	-2.326	-0.475	-4.616	0	-1.646
Block 1	shaft	66.12	0	0	0	0	0	0.026	-0.003	-0.024	0	0
Block 1	vestibule	54.8	0.3	0	0.37	8.3544	-0.819	0.633	0.241	-0.239	0	-0.11
Roof 1	mechanical	35.9	0	0	0	0	0	-0.212	0.65	-0.34	0	-0.098
Roof 1	IT closet	35.5	0	0	0	0	0	-0.231	0.665	-0.336	0	-0.097
Roof 1	storage	36.6	0	0	0	0	0	-0.953	3.218	-1.752	0	-0.512
Roof 1	attic	32.41	0	0	0	0	0	4.784	26.295	-18.939	0	-12.14

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Table 5 a ternat ve 1 zone non coincident cool ng loads

Block	Zone	Design Capacity (kBtu/h)	Design Flow Rate (ft3/min)	Total Cooling Load (kBtu/h)	Sensible (kBtu/h)	Latent (kBtu/h)	Air Temperatu re (°F)	Humidity (%)	Time of Max Cooling	Max Op Temp in Day (°F)	Floor Area (ft2)	Volume (ft3)	ft3/min-ft2	Design Cooling Load Per Floor Area(W/ft2)	Outside Dry-Bulb Temperatu re at Time of Peak Cooling Load(°F)	Glazing Gains (kBtu/h)	Wall Gains (kBtu/h)	Floor Gains (kBtu/h)	Roof and Ceiling Gains (kBtu/h)	Ventilation Gains (kBtu/h)	Infiltration Gains (kBtu/h)	Electric Equipment Gains (kBtu/h)	Lighting Gains (kBtu/h)	People Gains (kBtu/h)	Solar Gains (kBtu/h)	Mechanical ventilation fresh air rate (ft3/min)	Fresh air % of supply air (%)
Block 1	Exam 3 NE	6.88	192.352	5.99	4.35	1.64	75	56.1	Jul 07:30	76.2	367.51	4410.73	0.523	0.00549	70.67	6.28	-2.09	-2.55	-0.49	0	-0.05	0.88	0.11	0.21	2.26	0	0
Block 1	sprinkler	0	0	0	0	0	-	-	Jul 18:30	75.56	24.24	290.96	0	0	32	0	0.06	-0.16	0.09	0	0.01	0	0	0	0	0	0
Block 1	office 1 NE	1.2	28.946	1.05	0.64	0.4	75	62.3	Jul 07:30	75.99	99.41	1193.06	0.291	0.00355	70.67	0.99	-0.32	-0.61	-0.06	0	-0.02	0.24	0.03	0.06	0.36	0	0
Block 1	waiting	2.67	41.484	2.32	0.87	1.45	75	86.5	Sep 15:00	74.07	387.19	4646.99	0.107	0.00202	84.38	0	-0.08	-1.86	0.56	0	0	0.67	0.61	0.96	0	0	0
Block 1	office 1 NW	1.19	28.058	1.04	0.62	0.41	75	63.3	Jul 07:30	76.32	110.62	1327.63	0.254	0.00316	70.67	0.98	-0.31	-0.66	-0.06	0	-0.02	0.26	0.03	0.06	0.36	0	0
Block 1	conference room	15.9	441.014	13.83	10.07	3.76	75	56.4	Jul 17:00	79.34	510.78	6130.31	0.863	0.00912	85.34	4.13	-0.53	-3.88	1.04	0	0.12	1.52	0.12	5.98	1.74	0	0
Block 1	corridor	0	0	0	0	0	-	-	-	74.89	1571.1	18489.47	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0
Block 1	staff break	3.11	86.248	2.7	1.98	0.72	75	56.4	Jul 13:00	79.01	233.42	2801.48	0.37	0.0039	87.27	0.4	-0.35	-1.33	0.33	0	0.03	1.09	0.1	1.45	0.29	0	0
Block 1	check in	1.93	58.23	1.68	1.35	0.34	75	53.3	Jul 15:00	74.47	449.54	5395.32	0.13	0.00126	88.34	0	-0.29	-2.28	0.98	0	0	1.07	1.34	0.52	0	0	0
Block 1	room 1 SW	0.33	8.493	0.29	0.18	0.11	75	60	Jul 15:00	76.96	34.87	418.49	0.244	0.00281	88.34	0	0.05	-0.22	0.1	0	0.03	0.08	0.1	0.04	0	0	0
Block 1	procedure room SE	7.99	263.598	6.95	6.19	0.76	75	50.2	Aug 15:00	76.37	557.16	6686.96	0.473	0.0042	88.16	5.24	-0.29	-3.79	0.95	0	0.24	1.33	0.17	0.65	1.83	0	0
Block 1	office 1 SE	2.73	95.286	2.37	2.27	0.1	75	48.4	Sep 15:00	77.26	121.28	1455.52	0.786	0.00659	84.38	2.49	-0.48	-1.01	0.02	0	0.02	0.29	0.04	0.14	0.82	0	0
Block 1	office 2 SW	2.83	99.09	2.46	2.36	0.1	75	48.3	Sep 15:00	77.42	121.28	1455.52	0.817	0.00684	84.38	2.49	-0.36	-1.03	0.01	0	0.02	0.29	0.04	0.14	0.82	0	0
Block 1	procedure room SW	9.44	311.414	8.21	7.17	1.04	75	50.2	Aug 15:00	77.58	577.31	6928.68	0.539	0.00479	88.16	7.14	-1.24	-4.08	0.79	0	0.23	1.38	0.17	0.67	2.3	0	0
Block 1	shaft	0	0	0	0	0	-	-	Jul 21:00	75.66	1.62	19.45	0	0	32	0	0.01	-0.02	0.01	0	0	0	0	0	0	0	0
Block 1	vestibule	0	0	0	0	0	-	-	Jun 07:30	82.74	44.66	535.94	0	0	32	0.4	-1.35	-0.89	-0.19	0	-0.02	0	0	0	2.2	0	0
Roof 1	mechanical	0	0	0	0	0	-	-	Jul 17:00	95	89.28	1006.35	0	0	32	0	-1.46	-0.37	0.39	0	-0.02	1.63	0	0	0	0	0
Roof 1	IT closet	0	0	0	0	0	-	-	Jul 15:00	92.26	89.28	944.08	0	0	32	0	-1.28	-0.36	0.39	0	-0.01	1.42	0	0	0	0	0
Roof 1	storage	0	0	0	0	0	-	-	Jul 20:00	87.71	470.51	6391.64	0	0	32	0	0.89	-1.26	0.47	0	-0.1	0	0	0	0	0	0
Roof 1	attic	0	0	0	0	0	-	-	Jul 17:30	91.1	5027.78	27992.26	0	0	32	0	-5.71	-12.74	20.21	0	-1.73	0	0	0	0	0	0
-	Totals	56.21	1654.213	48.88	38.04	10.84	50.7	24.9	N/A	95	10888.83	98520.82	0.152	1.51293	32	30.54	-15.14	-39.11	25.52	0	-1.28	12.15	2.87	10.9	12.98	0	0

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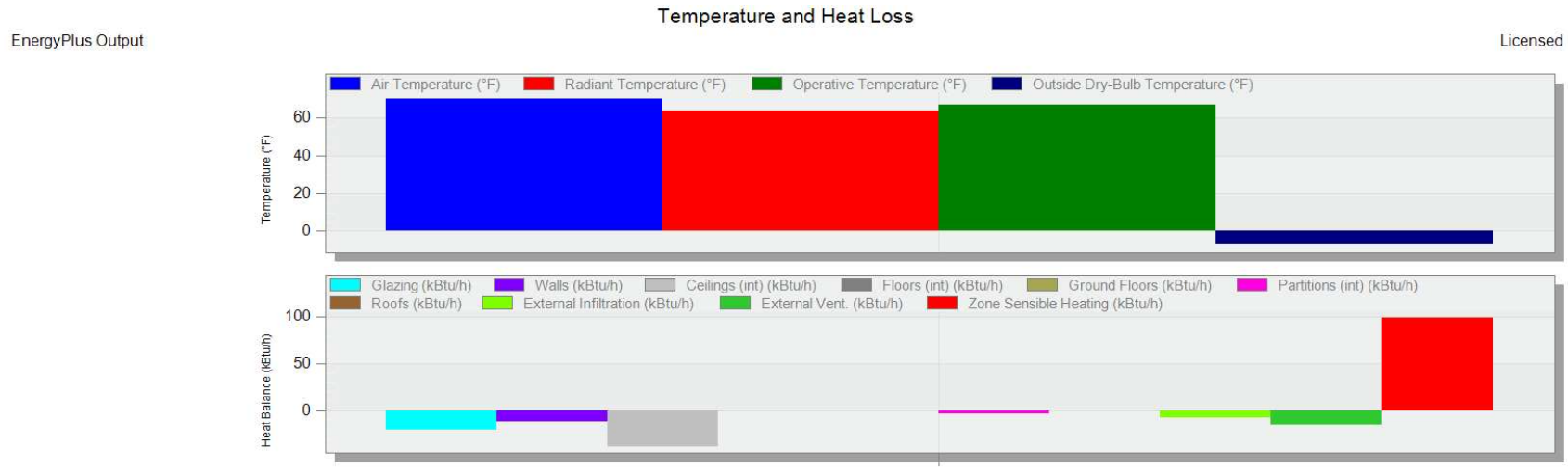
Alternative 4: ventilation and thermostat setbacks included

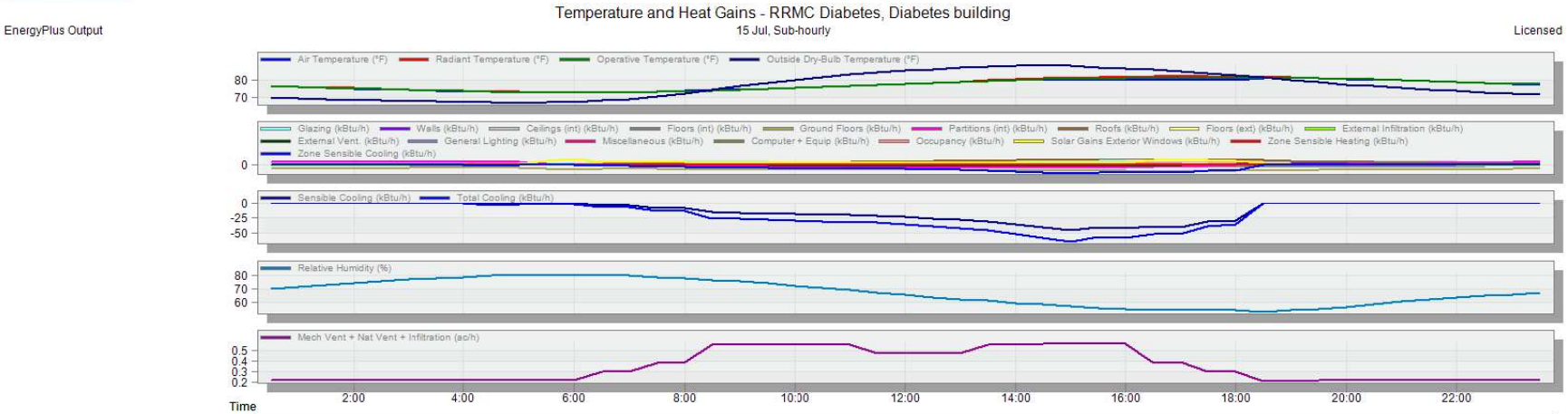
Figure 29 is the total building heating design heat balance for the proposed system that includes ventilation. The bottom-line number, *zone sensible heating*, is the total load on all heating components in the building.



Air Temperature (°F)	69.81
Radiant Temperature (°F)	63.60
Operative Temperature (°F)	66.70
Outside Dry-Bulb Temperature (°F)	-6.88
Glazing (kBtu/h)	-21.29
Walls (kBtu/h)	-11.81
Ceilings (int) (kBtu/h)	-38.10
Floors (int) (kBtu/h)	0.01
Ground Floors (kBtu/h)	-0.58
Partitions (int) (kBtu/h)	-3.31
Roofs (kBtu/h)	-0.50
External Infiltration (kBtu/h)	-7.65
External Vent. (kBtu/h)	-15.65
Zone Sensible Heating (kBtu/h)	98.91

Figure 29 total building heating design heat balance after the ERV heat recovery device.

Figure 30 is the total building coincident cooling design heat balance after the ERVs heat recovery device.



	2:00	4:00	6:00	8:00	10:00	12:00	14:00	16:00	18:00	20:00	22:00
Air Temperature (°F)	75.20	73.63	72.79	73.80	75.87	78.08	80.07	80.13	80.03	80.78	78.93
Radiant Temperature (°F)	75.44	73.83	72.98	73.53	75.45	77.98	80.53	82.00	82.02	80.93	79.13
Operative Temperature (°F)	75.32	73.73	72.89	73.66	75.66	78.03	80.30	81.06	81.03	80.86	79.03
Outside Dry-Bulb Temperature (°F)	68.63	67.35	67.35	72.49	80.20	85.56	88.34	87.05	83.20	77.63	73.77
Glazing (kBtu/h)	-2.34	-2.40	4.84	14.45	12.42	9.32	17.05	20.62	5.56	-0.93	-1.65
Walls (kBtu/h)	0.22	-0.06	-2.59	1.06	2.71	3.39	3.66	4.80	5.75	3.81	1.56
Ceilings (int) (kBtu/h)	9.15	7.50	1.54	-0.95	0.57	4.35	7.56	10.50	12.74	13.99	12.82
Floors (int) (kBtu/h)	-4.65	-3.42	-1.97	-2.23	-5.38	-9.88	-13.28	-13.25	-11.66	-10.90	-8.31
Ground Floors (kBtu/h)	-19.18	-16.78	-25.15	-23.87	-25.40	-26.52	-29.34	-31.62	-33.01	-26.84	-24.45
Partitions (int) (kBtu/h)	16.24	16.10	1.50	-9.30	-12.80	-14.26	-17.54	-11.61	-0.14	4.55	11.32
Roofs (kBtu/h)	0.61	-0.93	-1.87	0.58	8.27	16.94	23.57	29.27	26.43	15.18	7.37
Floors (ext) (kBtu/h)	-1.38	-1.28	-0.64	1.97	4.67	6.01	5.76	4.50	1.91	-0.80	-1.26
External Infiltration (kBtu/h)	-2.87	-2.64	-2.23	-0.57	1.22	1.92	1.87	1.41	0.03	-2.23	-2.72
External Vent. (kBtu/h)	0.00	0.00	0.00	-0.40	-3.03	-2.99	-4.97	-6.64	-1.38	0.00	0.00
General Lighting (kBtu/h)	0.00	0.00	0.00	4.39	4.77	4.72	4.77	4.43	0.00	0.00	0.00
Miscellaneous (kBtu/h)	0.00	0.00	0.00	0.00	1.52	1.52	1.52	1.52	0.00	0.00	0.00
Computer + Equip (kBtu/h)	0.79	0.79	1.04	10.63	10.63	10.63	10.38	2.32	1.80	1.80	1.55
Occupancy (kBtu/h)	0.00	0.00	0.00	1.94	9.79	10.28	10.87	6.93	0.00	0.00	0.00
Solar Gains Exterior Windows (kBtu/h)	0.00	0.00	28.40	13.15	9.18	7.78	10.00	12.02	19.16	0.00	0.00
Zone Sensible Heating (kBtu/h)	0.00	0.00	0.00	0.44	0.88	0.66	0.88	0.88	0.22	0.00	0.00
Zone Sensible Cooling (kBtu/h)	0.00	0.00	-1.19	-9.43	-18.67	-22.74	-35.24	-42.07	-29.05	0.00	0.00
Sensible Cooling (kBtu/h)	0.00	0.00	-1.19	-9.23	-18.92	-23.11	-35.86	-42.63	-29.13	0.00	0.00
Total Cooling (kBtu/h)	0.00	0.00	-1.79	-13.90	-29.00	-35.69	-51.73	-58.22	-35.95	0.00	0.00
Relative Humidity (%)	74.37	78.84	80.38	77.92	72.33	65.50	59.41	54.77	54.06	56.62	63.59
Mech Vent + Nat Vent + Infiltration (ac/h)	0.22	0.22	0.21	0.38	0.55	0.47	0.55	0.56	0.30	0.21	0.22

Figure 30 Total building coincident cooling design heat balance after the ERVs heat recovery device.

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Table 6 Zone heating design loads. Alternative 4 ventila ion in luded

Block	Zone	Comfort Temperature (°F)	Steady-State Heat Loss (kBtu/h)	Intermittent Heat Loss (kBtu/h)	Design Capacity (kBtu/h)	Design Capacity (Btu/h-ft2)	Glazing Gains (kBtu/h)	Wall Gains (kBtu/h)	Floor Gains (kBtu/h)	Roof and Ceiling Gains (kBtu/h)	Ventilation Gains (kBtu/h)	Infiltration Gains (kBtu/h)
Block 1	Exam 3 NE	66.16	9.09	0	11.37	30.9305	-3.57	-1.452	0.118	-2.826	-0.228	-1.133
Block 1	sprinkler	58.13	0	0	0	0	0	0.152	0.085	-0.165	0	-0.071
Block 1	office 1 NE	66.08	2.74	0	3.43	34.4888	-0.814	-0.78	0.046	-0.779	-0.062	-0.355
Block 1	waiting	66.99	3.62	0	4.52	11.6734	0	-0.396	-0.083	-2.824	-0.314	0
Block 1	office 1 NW	66.16	2.74	0	3.42	30.9568	-0.805	-0.704	0.045	-0.858	-0.069	-0.351
Block 1	conference room	66.27	22.45	0	28.07	54.9453	-3.512	-1.41	0.139	-3.751	-12.825	-1.091
Block 1	corridor	67.44	19.56	0	24.45	15.5615	-1.209	-5.06	-0.976	-11.175	-0.687	-0.451
Block 1	staff break	66.89	3.57	0	4.47	19.1331	-0.932	-0.341	-0.053	-1.727	-0.33	-0.191
Block 1	check in	67.18	3.53	0	4.42	9.8256	0	0.088	-0.177	-3.166	-0.279	0
Block 1	room 1 SW	67.32	0.98	0	1.22	35.0592	0	-0.438	-0.023	-0.313	0	-0.204
Block 1	procedure room SE	66.55	12.42	0	15.53	27.8747	-3.631	-2.387	0.004	-4.365	-0.345	-1.679
Block 1	office 1 SE	66.45	2.51	0	3.14	25.8506	-0.986	-0.319	0.02	-0.941	-0.075	-0.203
Block 1	office 2 SW	66.41	2.54	0	3.18	26.1847	-0.986	-0.358	0.024	-0.94	-0.075	-0.203
Block 1	procedure room SW	66.53	12.76	0	15.95	27.634	-4.034	-2.272	0.013	-4.505	-0.358	-1.604
Block 1	shaft	64.52	0	0	0	0	0	0.024	0	-0.023	0	0
Block 1	vestibule	54.54	0.38	0	0.48	10.7044	-0.815	0.542	0.25	-0.246	0	-0.11
Roof 1	mechanical	34.9	0	0	0	0	0	-0.206	0.635	-0.333	0	-0.096
Roof 1	IT closet	34.4	0	0	0	0	0	-0.225	0.649	-0.329	0	-0.095
Roof 1	storage	35.6	0	0	0	0	0	-0.93	3.146	-1.716	0	-0.5
Roof 1	attic	31.44	0	0	0	0	0	4.667	25.724	-18.554	0	-11.838

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Table 7 Zone cool ng design loads A ternat ve 4: venti at on inc uded

Block	Zone	Design Capacity	Design Flow Rate (ft3/min)	Total Cooling Load (kBtu/h)	Sensible (kBtu/h)	Latent (kBtu/h)	Air Temperature	Humidity (%)	Time of Max Cooling	Max Op Temp in Day (°F)	Floor Area (ft2)	Volume (ft3)	ft3/min-ft2	Design Cooling Load Per Floor	Outside Dry-Bulb	Glazing Gains (kBtu/h)	Wall Gains (kBtu/h)	Floor Gains (kBtu/h)	Roof and Ceiling Gains	Ventilation Gains (kBtu/h)	Infiltration Gains (kBtu/h)	Electric Equipment	Lighting Gains (kBtu/h)	People Gains (kBtu/h)	Solar Gains (kBtu/h)	Mechanical ventilation	Fresh air % of supply air (%)
Block 1	Exam 3 NE	7.03	189.364	6.11	4.35	1.76	75	56	Jul 07:30	76.2	367.51	4410.73	0.515	0.00561	70.67	6.28	-2.08	-2.55	-0.49	-0.21	-0.05	0.88	0.11	0.21	2.26	15.62	7.62
Block 1	sprinkler	0	0	0	0	0	-	-	-	75.61	24.24	290.96	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0
Block 1	office 1 NE	1.23	28.722	1.07	0.64	0.43	75	62.2	Jul 07:30	76.01	99.41	1193.06	0.289	0.00363	70.67	0.99	-0.31	-0.61	-0.06	-0.04	-0.02	0.24	0.03	0.06	0.36	4.225	12.824
Block 1	waiting	2.93	63.387	2.55	1.33	1.21	75	65.8	Jul 15:00	74.81	387.19	4646.99	0.164	0.00222	88.34	0	0.17	-2.07	0.93	-0.28	0	0.67	0.61	0.96	0	43.015	40.427
Block 1	office 1 NW	1.27	37.482	1.1	0.83	0.27	75	52.4	Jul 15:00	76.3	110.62	1327.63	0.339	0.00335	88.34	0.32	0.16	-0.73	0.26	-0.14	0.05	0.26	0.17	0.13	0.21	9.404	20.056
Block 1	conference room	17.35	455.308	15.09	9.86	5.22	75	57.1	Jul 16:00	78.01	510.78	6130.31	0.891	0.00995	87.05	4.2	-0.76	-3.78	0.9	-1.88	0.14	1.52	0.12	5.98	1.52	158.342	25.803
Block 1	corridor	0.11	1.889	0.1	0.1	0	75	80.3	Jul 18:00	75.02	1571.1	18489.47	0.001	0.00002	83.2	0.25	2.22	-7.83	4.9	0.02	0.04	0	0	0	0.49	23.566	92.58
Block 1	staff break	3.56	86.749	3.09	1.83	1.27	75	60.2	Jul 11:30	79.35	233.42	2801.48	0.372	0.00447	84.48	0.37	-0.42	-1.27	0.19	-0.33	0.02	1.09	0.1	1.45	0.29	33.995	28.155
Block 1	check in	2.53	70.989	2.2	1.42	0.78	75	54.4	Jul 15:00	74.51	449.54	5395.32	0.158	0.00165	88.34	0	-0.25	-2.29	0.97	-0.5	0	1.07	1.34	0.52	0	38.212	34.992
Block 1	room 1 SW	0.36	8.96	0.32	0.19	0.13	75	59.8	Jul 15:00	76.96	34.87	418.49	0.257	0.00306	88.34	0	0.06	-0.22	0.1	-0.03	0.03	0.08	0.1	0.04	0	2.964	24.86
Block 1	procedure room SE	8.55	269.58	7.44	6.28	1.15	75	50.2	Aug 15:00	76.4	557.16	6686.96	0.484	0.0045	88.16	5.24	-0.24	-3.8	0.95	-0.54	0.24	1.33	0.17	0.65	1.83	47.359	14.943
Block 1	office 1 SE	2.8	93.225	2.44	2.29	0.15	75	48.4	Sep 15:00	77.28	121.28	1455.52	0.769	0.00677	84.38	2.49	-0.47	-1.01	0.02	-0.06	0.02	0.29	0.04	0.14	0.82	10.308	9.957
Block 1	office 2 SW	2.9	96.701	2.52	2.38	0.15	75	48.3	Sep 15:00	77.43	121.28	1455.52	0.797	0.00701	84.38	2.49	-0.36	-1.03	0.01	-0.06	0.02	0.29	0.04	0.14	0.82	10.308	9.633
Block 1	procedure room SW	10.01	315.42	8.7	7.27	1.44	75	50.2	Aug 15:00	77.6	577.31	6928.68	0.546	0.00508	88.16	7.14	-1.2	-4.09	0.79	-0.54	0.23	1.38	0.17	0.67	2.3	49.071	13.463
Block 1	shaft	0	0	0	0	0	-	-	-	75.74	1.62	19.45	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0
Block 1	vestibule	0	0	0	0	0	-	-	Jun 07:30	82.74	44.66	535.94	0	0	32	0.4	-1.35	-0.89	-0.19	0	-0.02	0	0	0	2.2	0	0
Roof 1	mechanical	0	0	0	0	0	-	-	Jul 17:00	95.03	89.28	1006.35	0	0	32	0	-1.46	-0.37	0.39	0	-0.02	1.63	0	0	0	0	0
Roof 1	IT closet	0	0	0	0	0	-	-	Jul 15:00	92.29	89.28	944.08	0	0	32	0	-1.29	-0.36	0.39	0	-0.01	1.42	0	0	0	0	0
Roof 1	storage	0	0	0	0	0	-	-	Jul 20:00	87.73	470.51	6391.64	0	0	32	0	0.93	-1.26	0.47	0	-0.1	0	0	0	0	0	0
Roof 1	attic	0	0	0	0	0	-	-	Jul 17:30	91.13	5027.78	27992.26	0	0	32	0	-5.7	-12.71	20.18	0	-1.73	0	0	0	0	0	0
-	Totals	60.63	1717.774	52.72	38.77	13.95	58.77	39	N/A	95.03	10888.83	98520.82	0.158	1.63186	32	30.17	-12.36	-46.87	30.7	-4.57	-1.17	12.15	3.01	10.96	13.1	446.391	20.626

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HVAC system control checks

Alternative 1 Existing conditions

The model showed zero unmet hours.

Boiler

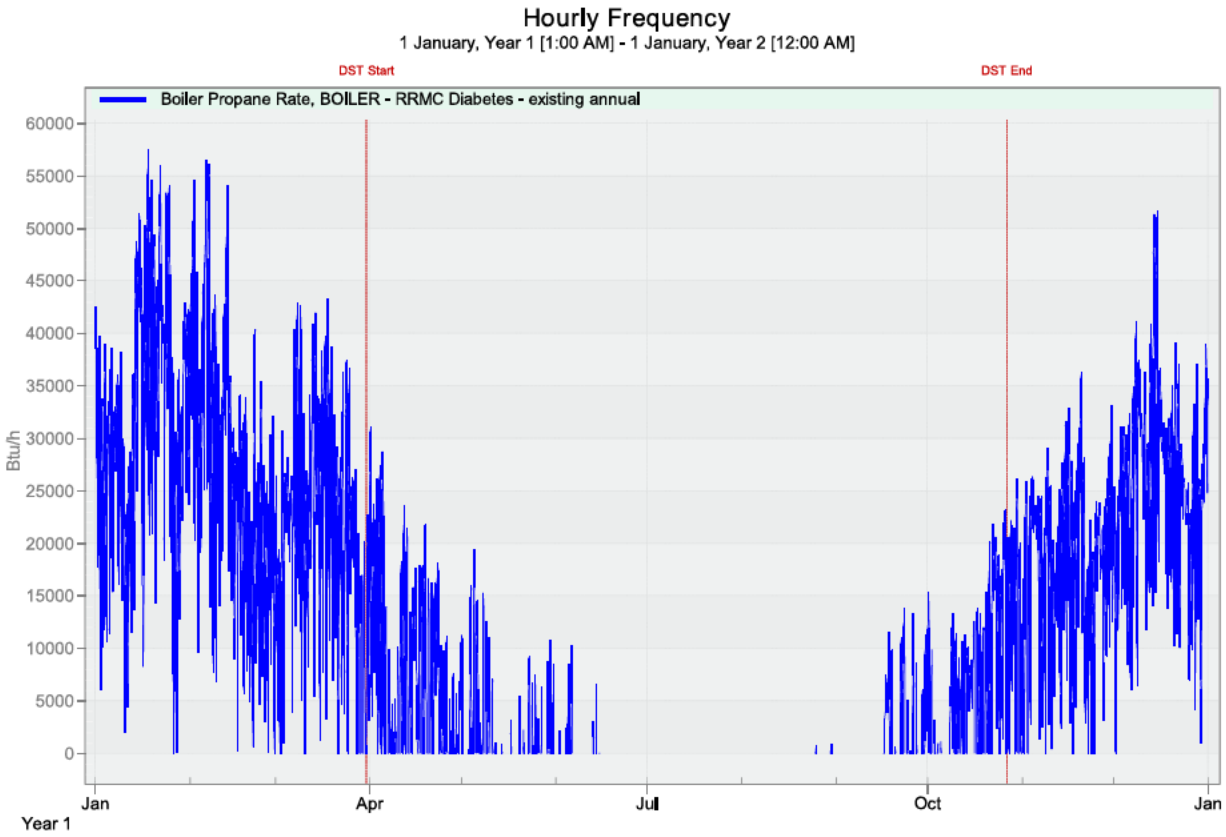

Figure 31 Boiler propane rate

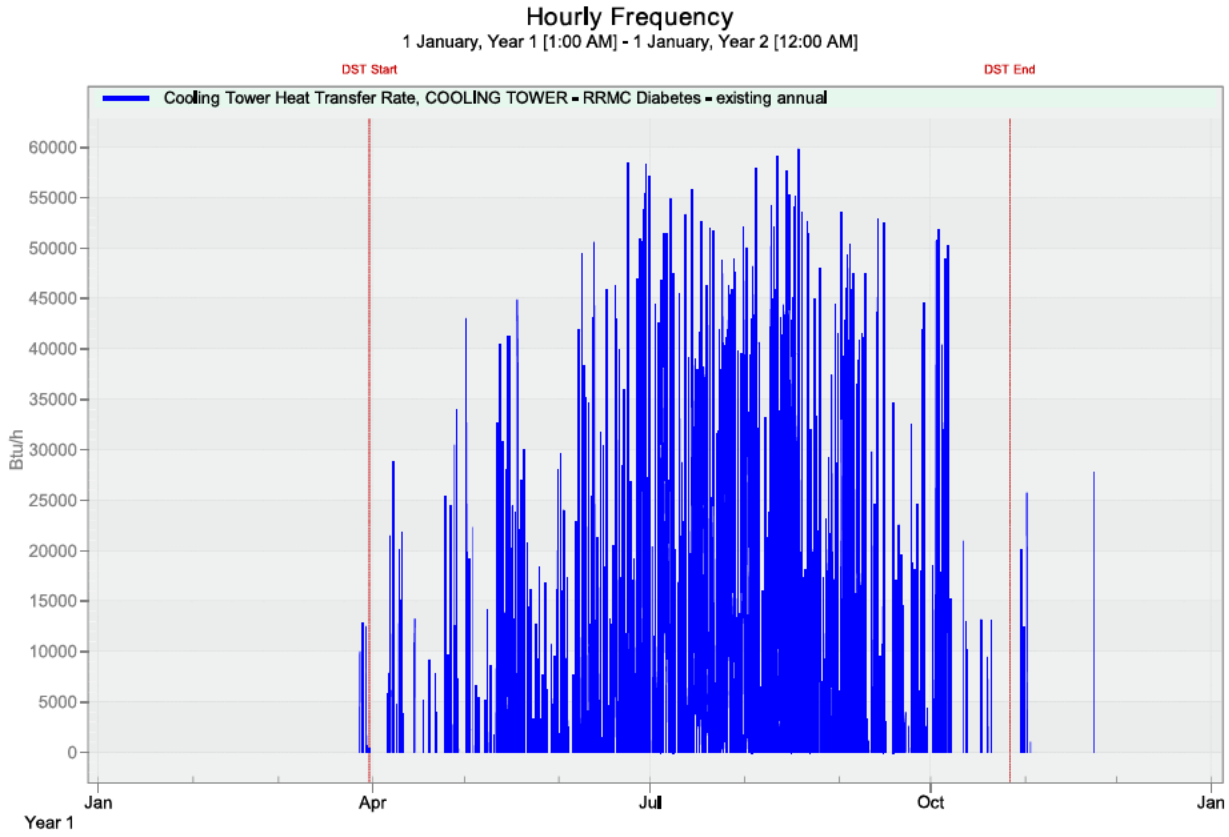

Figure 32 Cooling tower heat transfer rate.

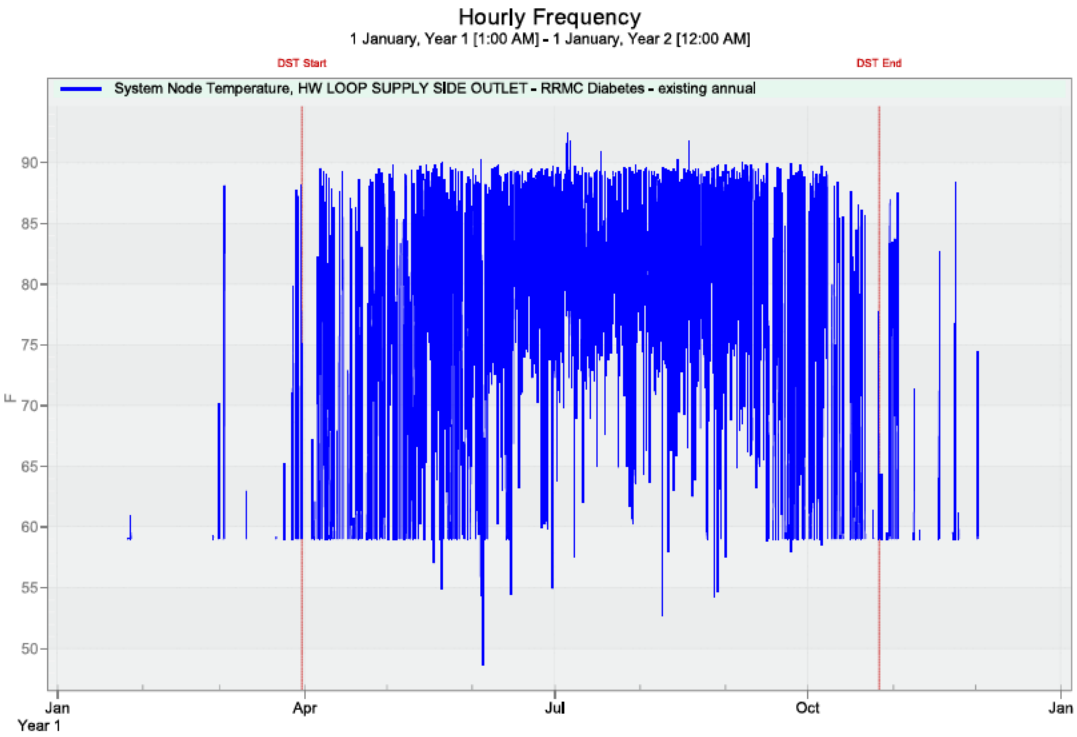

Figure 33 Mixed water heat pump loop upply temperature

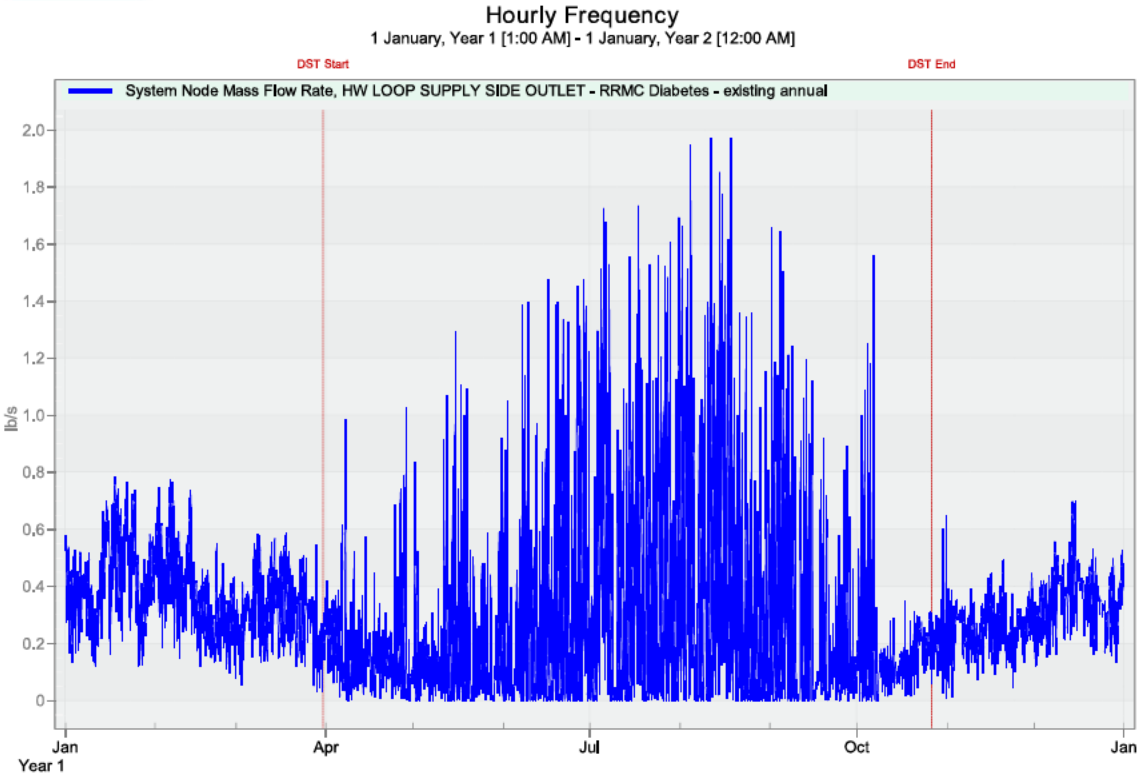

Figure 34 Mixed water heat pump loop mass flow rate

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Alternative 2: Ground Heat Exchanger

The model showed zero unmet hours.

Ground Heat Exchanger

See Figure 5 through Figure 14.

Alternative 4: Ground heat exchanger with central ERV

Ground Heat Exchanger

See Figure 11 through Figure 13.

Central ERV

Figure 35 through Figure 37 show the central ERV supply air temperature, humidity ratio and mass flow rate. These charts give a good idea of the controls. What is difficult to tell is the drift temperature that occur when the system is off. Looking a the humidity ratio chart, it looks like there isn't any control. However, when the mass flow rate is overlaid on top of the humidity ratio, it becomes evident that control is being maintained

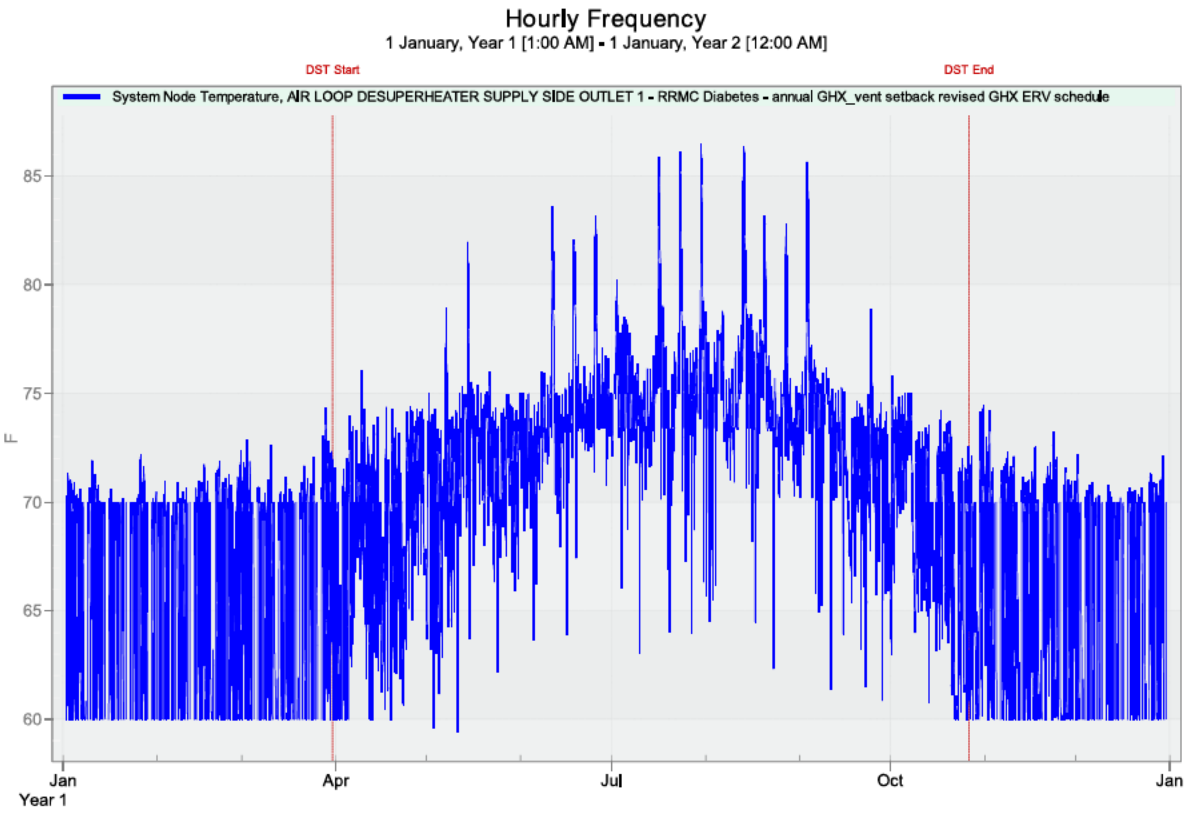

Figure 35 Central ERV supply air temperature.

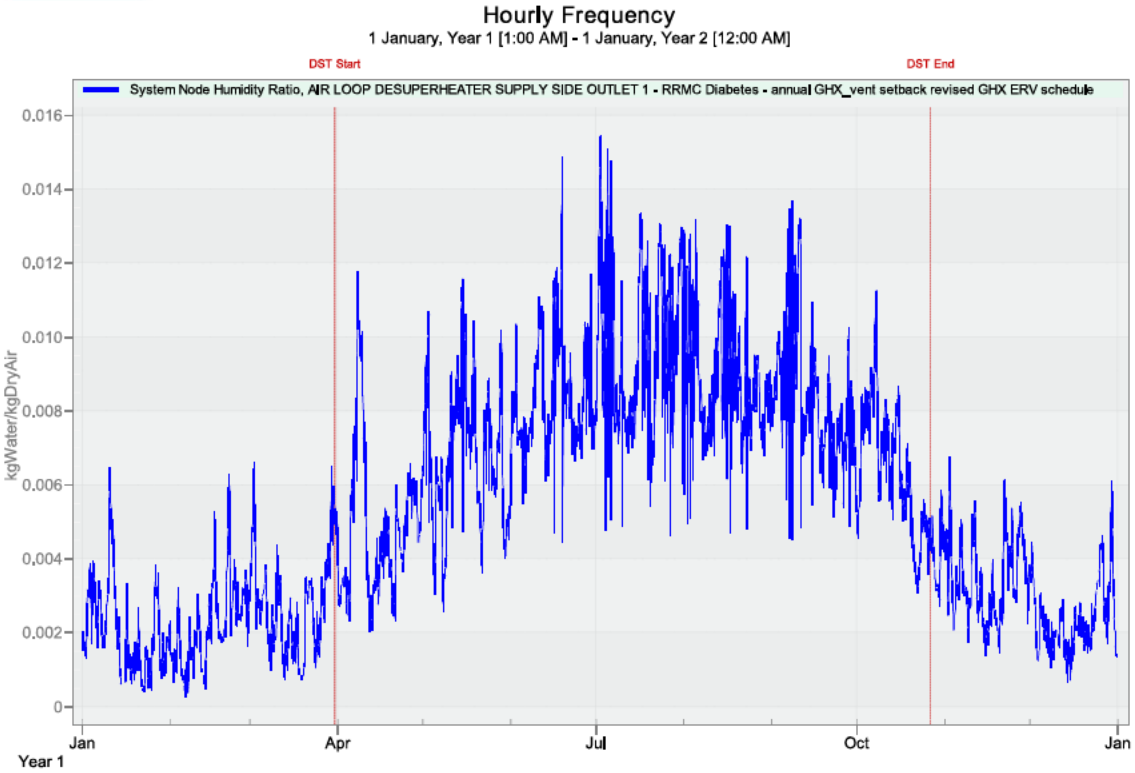

Figure 36 Central ERV upply air humidity ratio

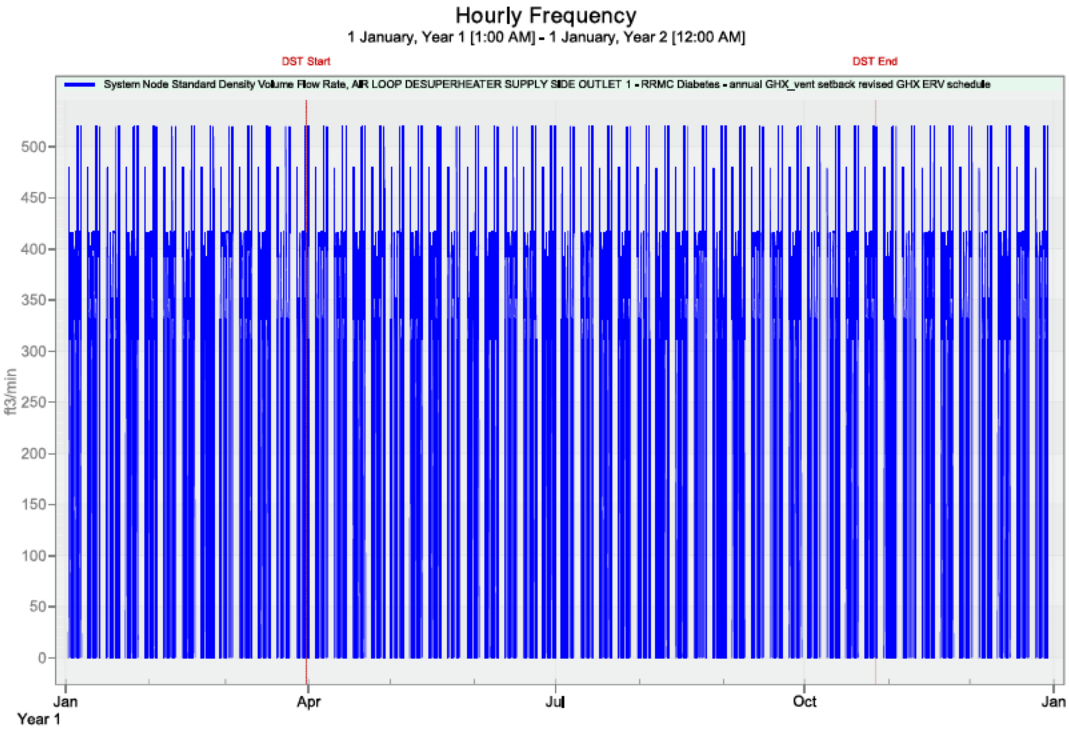

Figure 37 Central ERV upply air flow rate

Model input data

Directory *P:\Projects\22110\Energy Model\model data grid view*has csv files for the viewing the following model data inputs:

- Internal gains
- Setpoints and requirements
- Zone hvac
- Zone lighting

Occupancy Schedules

The occupancy schedule charts shown are for the summer design week. The weekend falls on August 12 and 13 for these charts. The owner should review these schedules and advise where changes can be made. Note the y-axis is the fraction of maximum calculated occupancy for each associated zone.

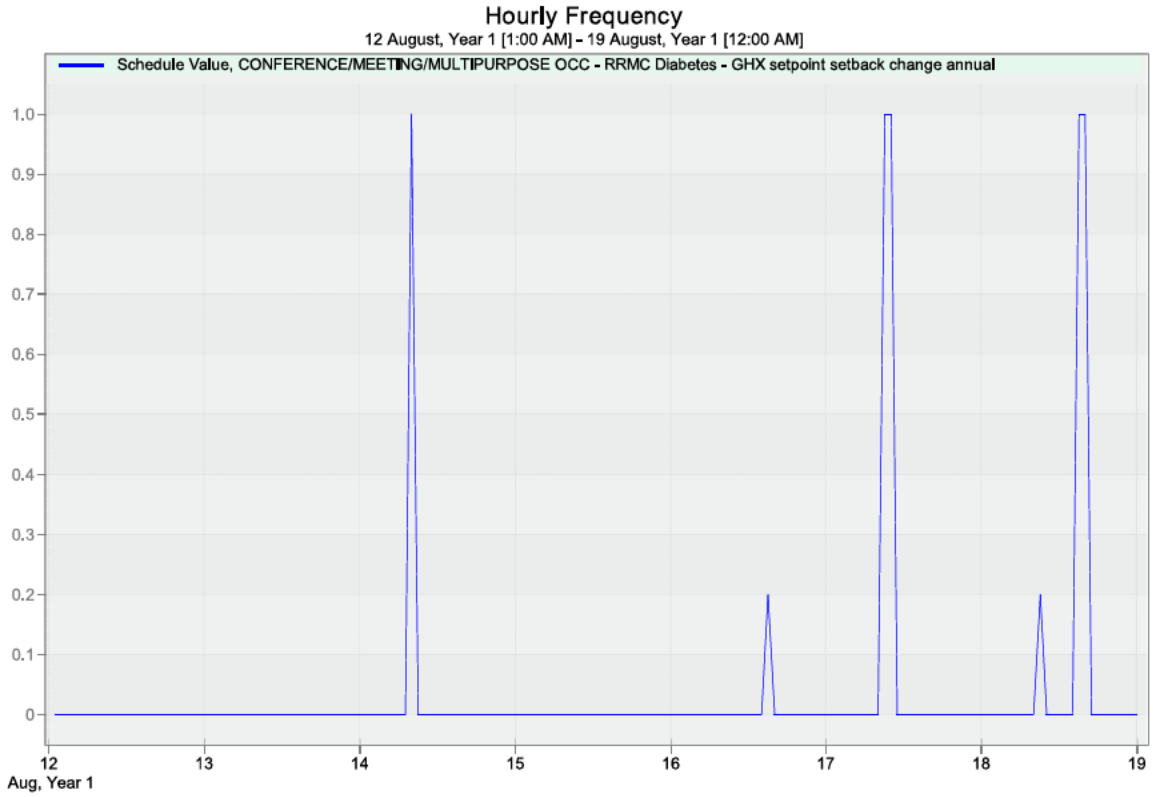

Figure 38 Conference room occupancy schedule.

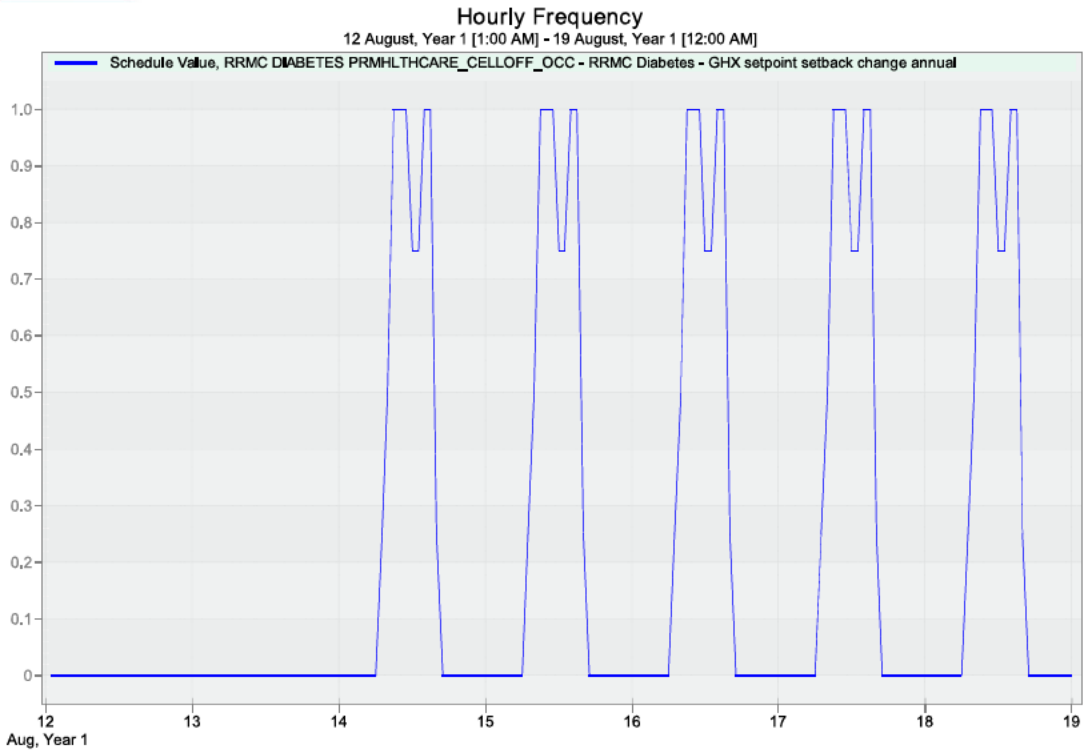

Figure 39 Occupancy schedule for the following rooms: exam, offices, check in, nurse stations and procedure rooms.

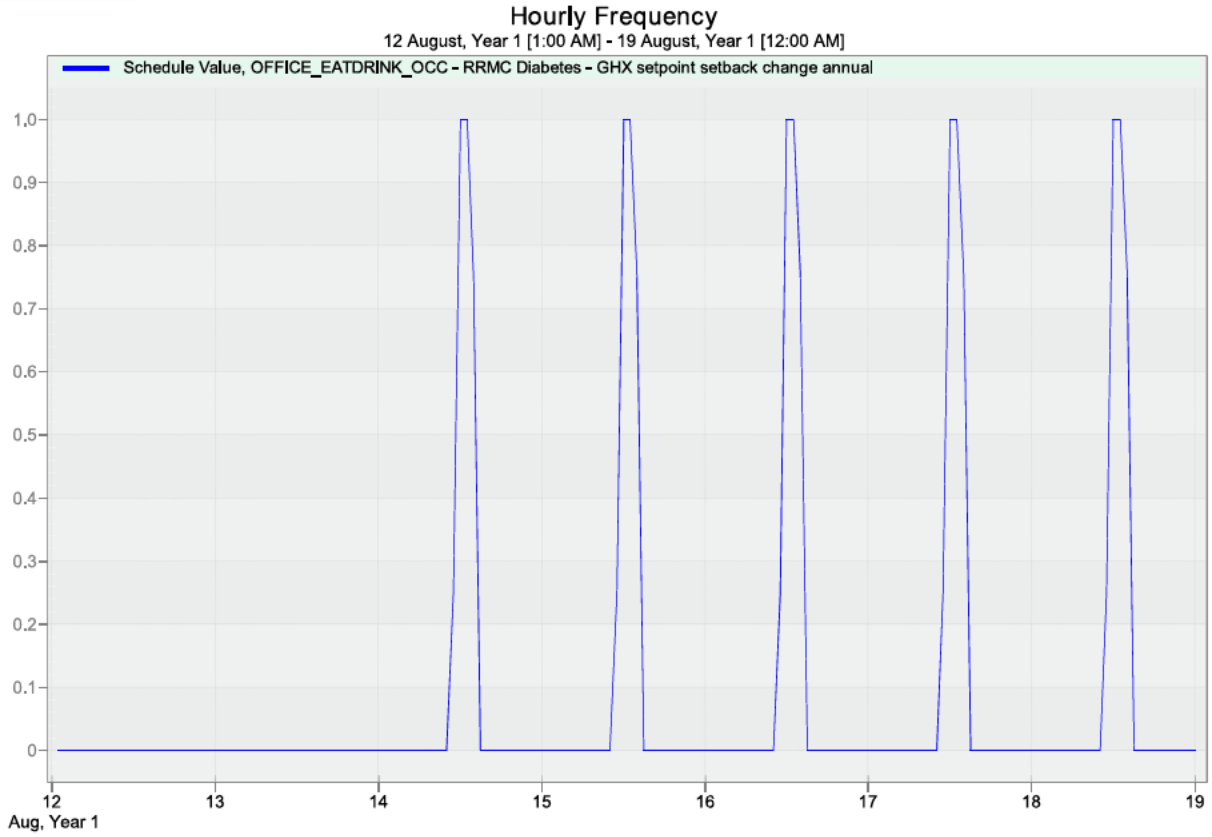

Figure 40 office break room occupancy schedule.

Calibration methods

The following steps were taken to increase annual propane consumption to match the utility data from 2015. The envelope report says that in year 2015, the facility consumed 1511 gallons of propane:

- internal office equipment gains from 1.01 to 0.7
- attic floor roof insulation reduced to 0"
- occupancy density from 0.007617 to 0.005
- IT closet not on heatpump loop
- lighting to LED with daylight controls
- boiler switched from condensing to ASHRAE 90.1 Appendix G baseline boiler.
- DHW usage up to 0.0087
- adjusted occ and equip schedules to end at 4pm
- lowered target illuminance to 35 fc
- increased window size for doors
- changed external walls to R-19
- increased infiltration - to account for exhaust fans
- changed roof insulation to 3" polyiso - R-16.8
- corridor office gains off.
- changed heating setpoint to 72F
- added 3' of roof overhang
- merged zones according to demo plan of LN consulting project # 16106
- adding blinds
- Changed mixed water loop low end setpoint to 66F from 59F.

Table 8 shows that the model is predicting a total of 1272 gallons of propane. This is a relative difference of 16%.

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Table 8 Modeled Propane usage for the facility

	PROPANE:FACILITY [kBtu]	PROPANE:FACILITY {Maximum}[kBtu/h]	PROPANE:FACILITY [gallons]
January	25265.4	58.6	276.1
February	19617.7	62.4	214.4
March	17279.9	48.8	188.8
April	5944.3	33.7	65.0
May	2072.9	26.5	22.7
June	1318.2	23.3	14.4
July	1103.1	20.5	12.1
August	1179.4	19.8	12.9
September	1827.3	21.1	20.0
October	6152.0	32.2	67.2
November	13731.6	43.7	150.1
December	20905.9	57.1	228.5
Annual Sum or Average	116397.6		1272.1
Minimum of Months	1103.1	19.8	
Maximum of Months	25265.4	62.4	

Table 9 Monthly propane u age by end u e

	HEATING:PROPANE [kBtu]	WATERSYSTEMS: PROPANE [kBtu]
January	23859.03	1406.37
February	18304.68	1313.01
March	15773.02	1506.91
April	4702.31	1241.95
May	754.87	1318.01
June	74.98	1243.2
July	0	1103.12
August	0	1179.35
September	701.24	1126.05
October	4949.82	1202.22
November	12433.97	1297.66
December	19577.06	1328.81
Annual Sum or Average	101130.98	15266.65
Minimum of Months	0	1103.12
Maximum of Months	23859.03	1506.91