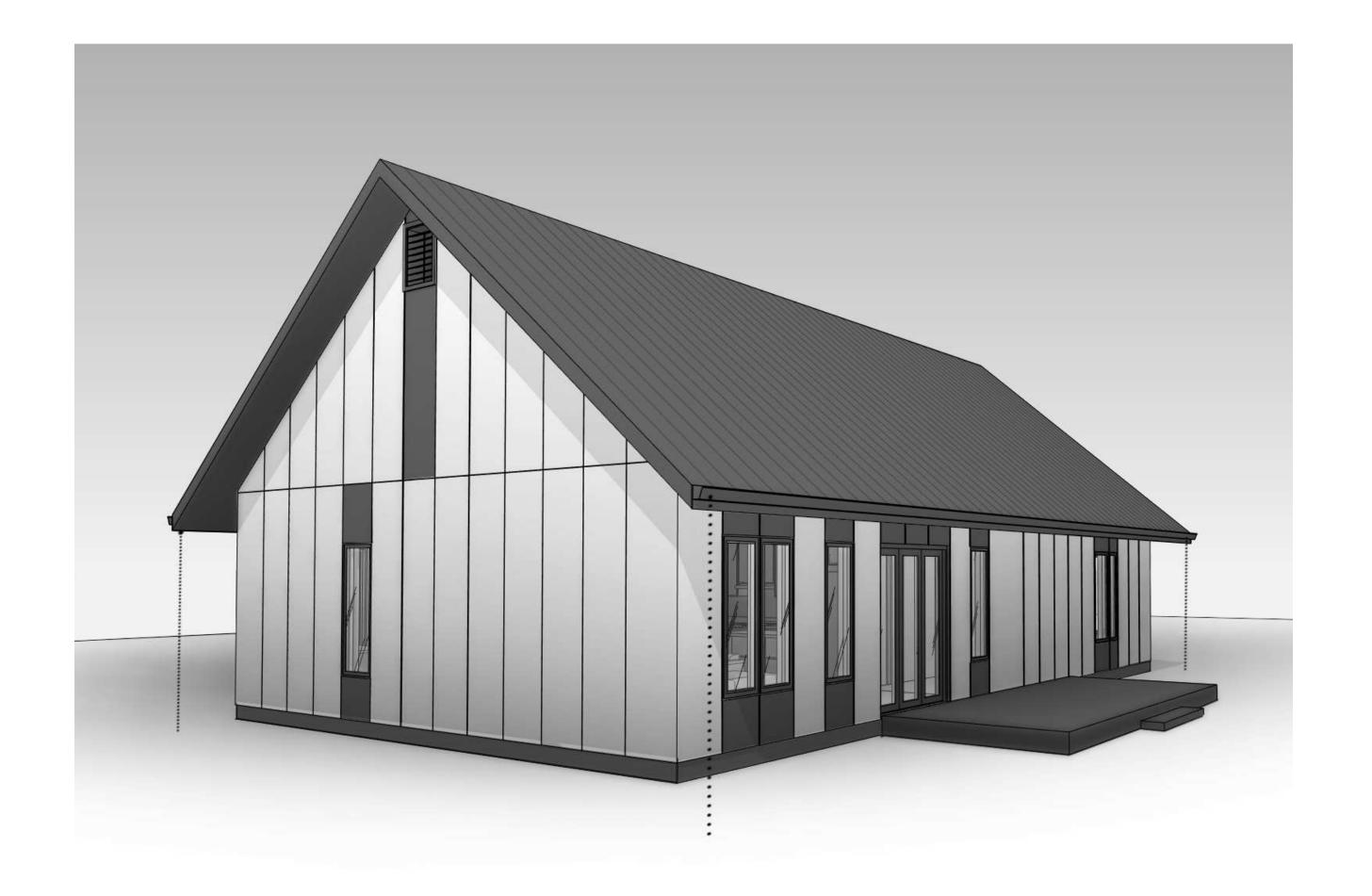
lowa - High Performance Prototype Home





General notes Plan / Sections - 2 bedroom slab-on-grade Elevations - 2 bedroom slab-on-grade Plan / Sections - 4 bedroom occupied attic Elevations - 4 bedroom occupied attic Wall sections Wall types and basement

Cover Sheet

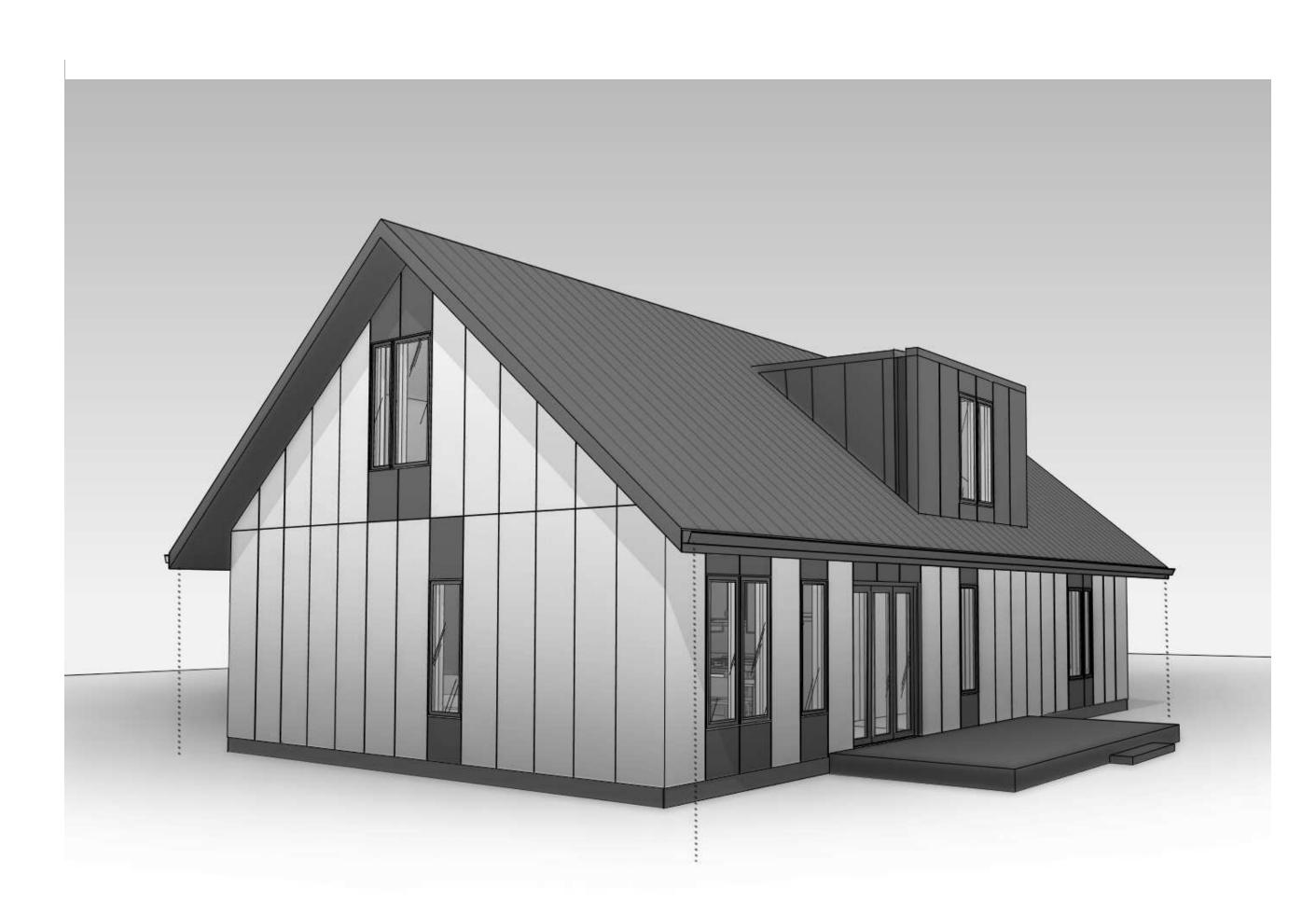
Roof plan / site concept Development orientation

Performance criteria Green Streets / energy

Green Streets checklist Green Streets checklist Green Streets checklist

Iowa Energy Office

Iowa Economic Development Authority 1963 Bell Ave., Suite 200 Des Moines, Iowa 50315



Funded through a grant by: American Recovery and Reinvestment Act (ARRA)

Schematic Design **Documents**

lowa - High Performance Prototype Home

Iowa Energy Office

Iowa Economic Development Authority

	Project No:	20023.00
May 1, 2021		
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1		

Goals of the IEDA Prototype Home: This prototype design funded by the Iowa Energy Office of the Iowa Economic Development Authority (IEDA), is aimed at providing guidance for more affordable, energy-efficient, single-family, detached homes for the lowa climate. While this design is not specifically endorsed by the Department of Energy Zero Energy Ready Home Program (ZERH), the design is intended to support the goals and requirements of the ZERH program and other holistic concepts of sustainable design and construction including storm water management, energy efficiency, water use, materials, and indoor environmental / air quality as prescribed in the Iowa Green Streets Criteria as developed by the Iowa Economic Development Authority.

Prototype Concepts:

- A. **Base Home**: 1196 sf 2 Bedroom, 1 Bathroom, Slab-on-Grade with an option of building a detached garage and a basement.
- B. 1½ Story Home: 1841 sf 4 Bedroom, 2 Bathroom, Slab-on Grade with option of building a detached garage and a basement.
- C. Energy Models were developed for each concept.

Iowa Green Streets Criteria: The Iowa Green Streets Criteria promote public health, energy efficiency, water conservation, smart locations, operational savings, and sustainable building practices. Since 2008, the Iowa Green Streets Criteria has influenced the performance of thousands of residences and numerous community facility and Main Street projects across Iowa. This home plan builds on lessons learned by the lowa Economic Development Authority, Enterprise Green Communities and from the growing body of building science research and demonstration projects.

This prototype home plan is intended to demonstrate strategies that will enhance affordable housing through high performance residential design. The Iowa Green Streets Criteria are applied to CDBG-Funded projects administered by IEDA. This prototype home is intended for use, to educate and to guide applicants for CDBG projects; however, strategies included in these schematic documents, can be applied as appropriate to any single-family residential project across the state. Many details and strategies included in this prototype are required by the current International Energy Conservation Code adopted by the State of Iowa.

Schematic Design Documents: It is important to note that these documents are intended to be schematic guide documents that could be applied to locations across the entire state of lowa in Climate Zones 5 or 6. Given the variability across lowa of site conditions / soil types for foundation and storm water design; snow and wind loading code requirements for foundations, wall construction and roof truss / structural design; and the local jurisdictions and permit review processes; the final construction documents needed to build the home require final detail development and collaboration with a structural engineer and material suppliers, builders, HVAC and Electrical Design / Builders, landscape installers, etc.

The first intent of the Iowa Green Streets Criteria is to utilize integrated design methods which require all parties involved in the design and construction of buildings to be involved from design through construction completion; therefore, the prototype design options included here need additional design integration and development for successful code-compliance or exceeding code-compliance.

General Notes:

- 1. This schematic design drawing set is intended to indicate design intent and for use as a basic guide for further development only and is not intended to be complete in all respects and details. Use of this schematic design drawing set shall be used solely for this intended purpose and any use, construction, conversion, modification, misinterpretation, or misuse of this schematic design drawing set without written verification, completion, or adaptation by BNIM as appropriate for the specific use intended, will be at user's sole risk and without liability or legal exposure to BNIM, its officers, directors, members, partners, agents and employees.
- 2. BNIM is providing this schematic design drawing set for use by the public in lowa "as is, with all faults and inconsistencies," without representations or warranties of any kind, either express or implied, including implied warranties of merchantability or fitness for a particular purpose.
- 3. This schematic design drawing set does not have an architectural or engineering signature, seal and/or stamp. Prior to use of this schematic design drawing set, it is recommended that: (a) user consult with the local building official to determine whether review of this schematic design drawing set by a licensed architect or engineer is required prior to submission for a building permit; and, (b) user obtain proper professional assistance to provide standard construction details and practices, which will result in a structurally sound and weatherproof finished product.
- 4. A state, county, and municipality may have various adopted building codes, zoning requirements, ordinances, and/or building regulations. BNIM makes no representation or warranty that this schematic design drawing set will comply with any such local requirements. Use of this schematic design drawing set is conditioned on user's acknowledgement and agreement to: (a) consult with a locally licensed architect or engineer and city code officials or user's choice prior to commencing construction; and, (b) strictly complying with all local building codes, zoning requirements, and other applicable laws, regulations, ordinances, and requirements. Any use of this schematic design drawing set without complying with these conditions will be at user's sole risk and without liability or legal exposure to BNIM, its officers, directors, members, partners, agents, and employees.
- 5. This schematic design drawing set (with options) has been modeled to operate at a certain predicted level of energy efficiency given many assumptions of rated equipment and appliance efficiencies, installed performance, installed insulation and quality materials, code compliant air sealing, and assumed occupant living / usage patterns among others. BNIM makes no representation or warranty this schematic design drawing set will perform to a specific level of energy efficiency or long-term performance since the final design, configuration, procurement, and installation of all materials and systems will be completed by user and/or its consultants.
- 6. To the fullest extent permitted by law, any use of this schematic design drawing set is conditioned on and user agrees user shall defend, indemnify and hold harmless BNIM and The Iowa Economic Development Authority, their officers, directors, members, partners, agents, employees, and assigns (collectively, the "Indemnified Parties") from and against any and all losses, demands, causes of action, damages, liabilities, and costs and expenses, including reasonable attorneys' and consultants' fees, incurred or sustained by any of the Indemnified Parties arising out of or resulting from: (a) any use, construction, conversion, modification, misinterpretation, misuse by user or others of this schematic design drawing set; (b) any negligence or other acts or omissions by user or any of user's employees, consultants, advisors, agents, representatives or contractors; and, (c) any breach by user of any provisions of these General Notes.

Code Compliance: As of the date noted in these documents (May 2021), strategies particularly for energy efficiency and envelope performance shown in these schematic guide documents may exceed current energy codes adopted in the State of Iowa in an effort to demonstrate compliance with the Iowa Green Streets Criteria and ZERH program. As codes continue to evolve and be adopted in lowa, these guide documents may need to be updated to reflect new strategies and technologies yet to be developed or

These drawings should be considered incomplete for construction purposes and further development structurally, mechanically, and electrically, is required to build the home (ie electrical service size, HVAC system sizing and configuration, foundation dimensions and reinforcement, floor and roof truss sizing and detailing, etc.)

Local Jurisdiction: The user of these schematic guide documents must adhere at minimum to the building codes adopted by the community where it is intended to be built. As of May 1, 2021 when these documents are completed, the current Energy Efficiency Code adopted state-wide by the State of Iowa is the International Energy Conservation Code 2012 Edition (IECC 2012) and soon to be updated to a newer version in 2021. In the absence of a local adopted building code, the State of Iowa Adopted Building Codes would apply which as of May 1, 2021 include:

- 2015 International Residential Code as adopted by Iowa Administrative Rule 661-301
- 2012 International Energy Conservation Code as adopted by Iowa Administrative Rule 661-303
- Smoke Alarms/Detectors as adopted by Iowa Administrative Rule 661-210 (effective July 1, 2021)
- Carbon Monoxide Alarms as adopted by Iowa Administrative Rule 661-211
- State Mechanical Code as adopted by the Dept. of Public Health Iowa Administrative Rule 641-61
- State Plumbing Code as adopted by the Dept. Public Health Iowa Administrative Rule 641-25
- State Electrical Code as adopted by the State Electrical Licensing Board Iowa Admin. Rule 661-504 Any other applicable State of Iowa Adopted Codes – For a full listing of Iowa codes please refer to
- https://dps.iowa.gov/divisions/state-fire-marshal/building-code

Department of Energy Zero Energy Ready Home (ZERH): These prototype homes plans incorporate the prescriptive design related requirements defined by the US Department of Energy's Zero Energy Ready Home Program. It is important to note these plans have not been submitted to or endorsed by the DOE under this program. They have been developed utilizing these requirements as a guide. The basic strategies for Zero Energy Ready Homes include:

- A. Energy Star for Homes Baseline
 - a. Comply with program requirements for:
 - i. Thermal Enclosure
 - ii. HVAC Quality Installation (contractor or HERS rater)
 - b. Water Management
 - c. The Target home/size adjustment factor used in Energy Star
- B. Appliance / Lighting Fixtures
- a. Utilize Energy Star qualified appliances and fixtures
- C. Envelope a. Insulation - meet 2015 IECC levels (at minimum)
 - b. Fenestration Use high-performance windows that meet Energy Star for appropriate climate
 - a. In no event shall BNIM and The Iowa Economic Development Authority, their officers, directors, members, partners, agents and employees be liable for any indirect, punitive, incidental, special, exemplary or consequential damages arising out of or resulting in any way from the use of this schematic design drawing set.

Outline Performance Specification Requirements:

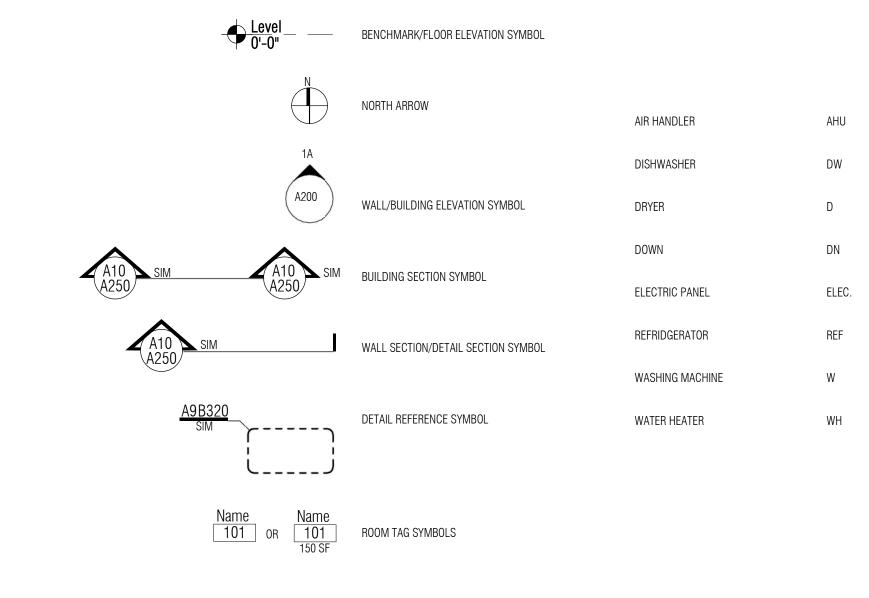
These are not exhaustive specifications, they are intended to highlight key items for energy and water management in particular the designer / contractor to consider when completing the home. Also refer to the Green Streets summary at the end of this set of documents (Sheets 11-14).

- 1. General Requirements:
 - a. Engage a HERS Rater early in the process of design validation for energy modeling, confirmation of energy efficiency measures and to confirm HERS rating process and inspections / testing.
 - b. If adhering to the Iowa Green Streets Criteria and/or the DOE Zero Energy Ready Home Program review both systems as an integrated team. Determine roles and responsibilities.
 - c. Develop a regular meeting schedule with all subcontractors / applicable trades.
 - d. Develop and adhere to a construction waste recycling plan.
 - e. Develop and adhere to an indoor air quality management plan during and after construction.
 - f. Protect all materials from moisture damage, decay and mold during construction.
 - g. Do not overload structure.
 - h. Develop and adhere to SWPP plans for storm water management during construction.
 - i. No smoking on site during construction
 - j. Do not incorporate damaged materials into the work. k. Install all materials per manufacturers written instructions.
- 2. Site Work
- a. Slope grade away from foundations
- b. Utilize Rain Garden Resources listed in these documents for rain garden sizing and for soil amendment / plantings.
- c. Direct downspouts to run rainwater toward rain gardens.
- d. Utilize native landscaping.
- e. Create zero entry entrances for accessibility.
- 3. Concrete / Foundations:
 - a. Consider fly ash additive.
 - b. Install 15 mil vapor barrier under slabs equal Stego.
 - c. Recommended to install R-5 insulation under slabs in addition to code requirement.
- d. Slope all concrete on site to drain water away from foundations.
- e. Do not slop concrete more than $\frac{1}{4}$ "/1' for stoops / landings at doors.
- f. Install a capillary break material and water stop between footing and foundation wall. g. Install modified bituminous self-adhering waterproofing membrane on wall and lap footing.
- h. Install 4" pvc drain tile in gravel with filter fabric.
- i. Install 2" insulation on the outside of the foundation wall.
- j. Coordinate egress windows in foundation walls
- 4. Masonry
- 5. Metals
- 6. Wood and Plastics
 - a. Utilize advanced framing details Advanced House Framing | Department of Energy
 - b. Prototype assumes LP Smartside products LP Corp or equal

- D. Optimized Ductwork
- a. Install ducts in conditioned space or in an optimized location as defined in the program specs
- E. Water Efficiency
 - a. Efficient Hot Water Distribution System or b. Use of a high-efficiency water heater and fixtures
- F. Indoor Air Quality
 - a. Follow EPA Indoor airPLUS program requirements
- G. Solar Ready
 - a. At minimum provide infrastructure for future PV installation

For a full description of the DOE ZERH Program please refer to:

https://www.energy.gov/eere/buildings/zero-energy-ready-homes



ANNOTATION SYMBOLS 1 1/2" = 1'-0" RE: /

ABBREVIATIONS

- c. Truss company to design all trusses, floor joists, etc. to building code loading requirements for specific building location.
- d. Drawings indicate "Thermalbuck" or equal window extensions to accommodate insulating sheathing / window attachment
- e. Install blocking in walls around toilets / tubs / showers for future grab bar installations
- 7. Thermal and Moisture Protection
 - a. R-Values modeled:
 - R-49 ventilated attic ii. R-33.5 Closed Cell Spray Foam for Occupied Attic
 - iii. R-22.5 blown insulation stud cavities
 - iv. R-5 CI at exterior walls
 - v. R-5 below slabs vi. R-10 outboard of foundation walls – interior foundation R-5 rigid boards
 - vii. Sound insulation around bedrooms
 - b. For closed cell spray foam in occupied attic option coordinate locations of thermal and ignition
 - barriers in inaccessible knee wall areas. Coordinate thermal barriers as well for closed cell foam at rim joists for basement option.
 - c. Rigid insulation R-10 outside of foundations cover exposed insulation with weather resistant
 - d. Utilize weather barrier over OSB and under insulating sheathing follow manufacturer's written instructions for all details and flashings. e. Assumed Smart Vapor Retarder – Certainteed Membrain or equal at all outside walls and ceilings
 - where required follow air barrier and sealing checklists in code and Green Streets.
- 8. Windows and Doors:
- a. Follow minimum U-Values in Green Streets / ZERH Programs U -0.30
- 9. Energy Star Appliances All electric building
- 10. Safe Room Design: Green Streets encourages the construction of a safe room. The prototype could accommodate the laundry room constructed as a safe room or a room in basement per FEMA P-320. An option is to install a premanufactured and approved unit in the garage - www.stormsheltersofia.com
- 11. Mechanical / Electrical Systems: (see Green Streets page for additional comments) a. Size all HVAC – Heating and Cooling Systems utilizing ACCA Manuals J, S, and D.
 - b. Utilize Quality Installation Procedures
 - c. Modeled Systems:
 - 2 ACH 50 Infiltration ii. Air Source Heat Pump (9HSPF, 16 Seer)
 - iii. Install Ductwork in conditioned space bulkheads are designed in ventilated attic space no ductwork to be placed in attic
 - iv. Balanced Ventilation w/ Recovery (SRE 74%)
 - v. 2.0 EF Heat Pump Water Heater, DHW Insulated R-3
 - vi. Energy Star Appliances vii. 100% LED Lighting Systems
 - viii. Water Sense Labeled Fixtures d. PV ready systems
 - i. Allow for 4'x4' space adjacent to electrical panel for future PV inverters
 - ii. Allow for PV related loads in roof truss designs
 - iii. Follow PV Ready Checklist from ZERH Program



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004	Elevations - 2 bedroom
	slab-on-grade
005	Plan / Sections - 4 bedroom
	occupied attic
006	Elevations - 4 bedroom
	occupied attic
007	Wall sections
800	Wall types and basement
	option
009	Roof plan / site concept
010	Development orientation
	options
011	Performance criteria
	Green Streets / energy
012	Green Streets checklist
013	Green Streets checklist
014	Green Streets checklist

Cover sheet

General Notes

slab-on-grade

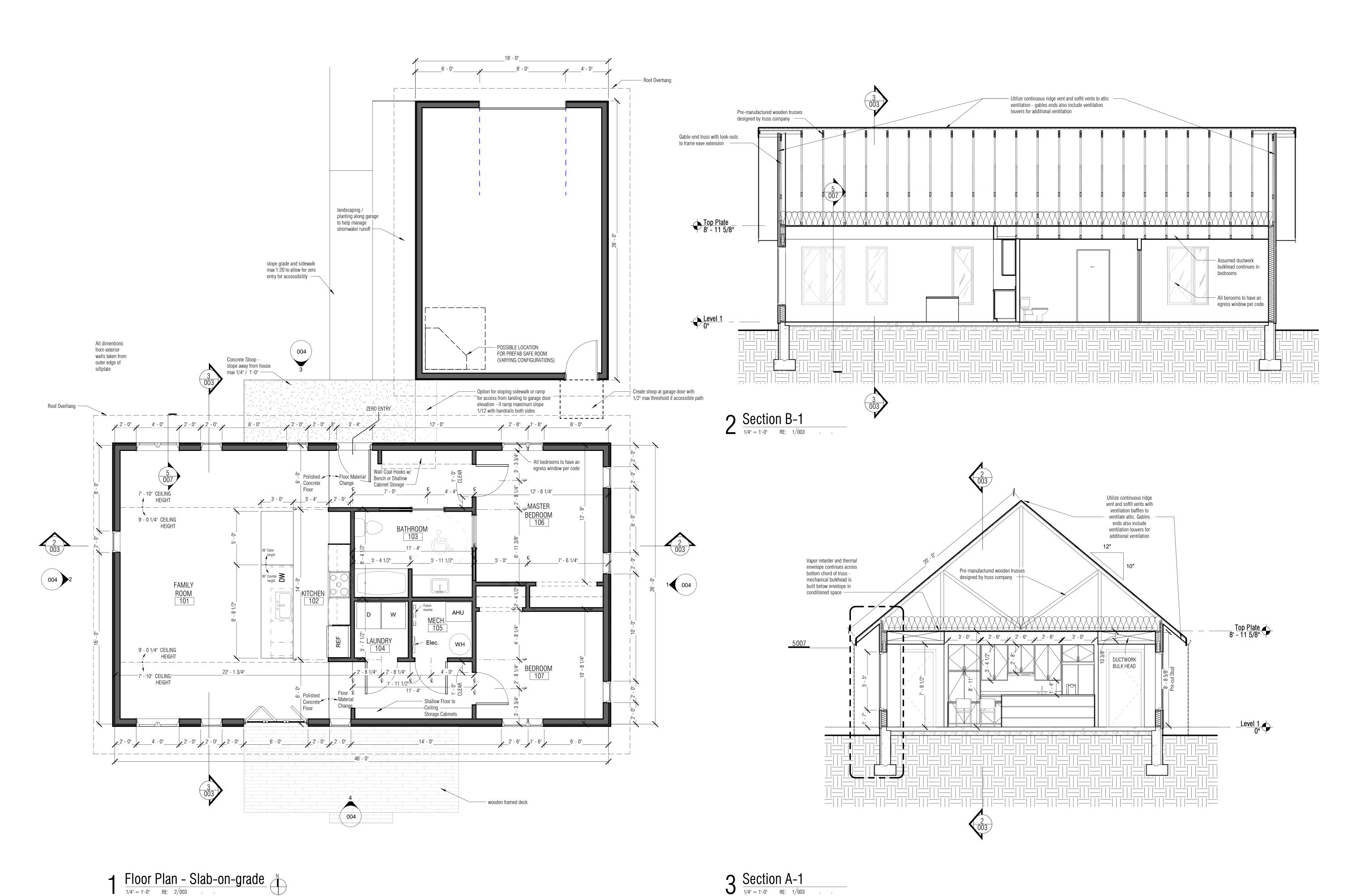
Plan / Sections - 2 bedroom

Schematic Design **Documents**

Iowa - High Performance Prototype Home

Iowa Economic Development Authority

Iowa Energy Office





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> Cover sheet General notes

Plan / Sections - 2 bedroom

Slab-on-grade Elevations - 2 bedroom

slab-on-grade Plan / Sections - 4 bedroom

occupied attic Elevations - 4 bedroom

occupied attic Wall sections

Wall types and basement

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Green Streets checklist

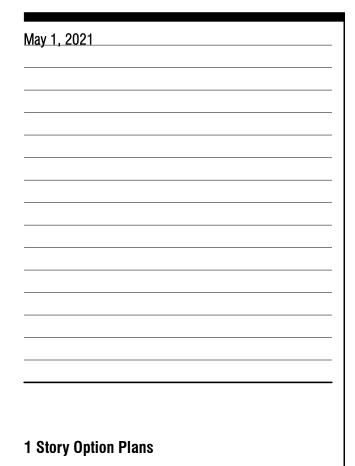
Schematic Design Documents

Iowa - High Performance Prototype Home

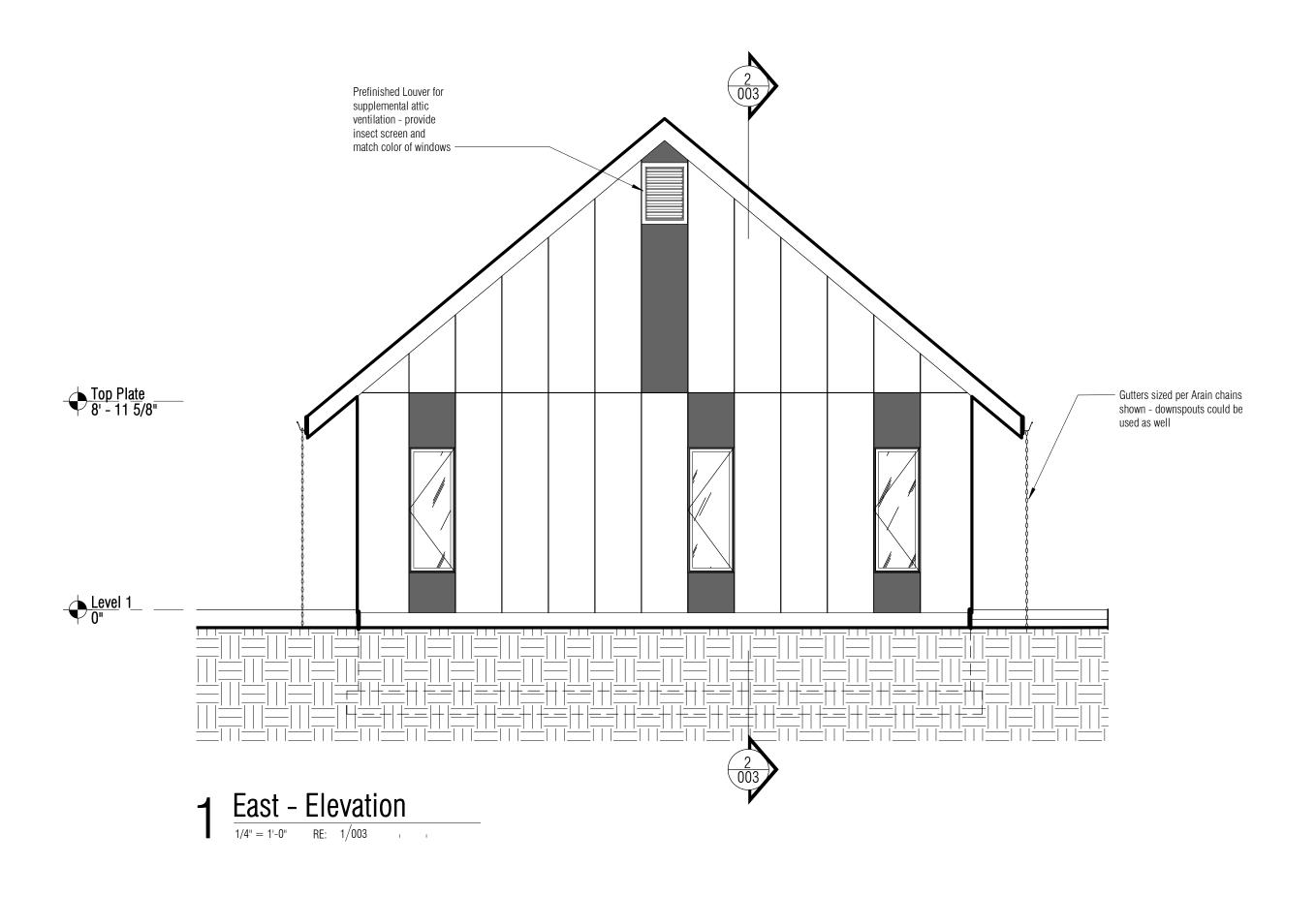
Iowa Energy Office

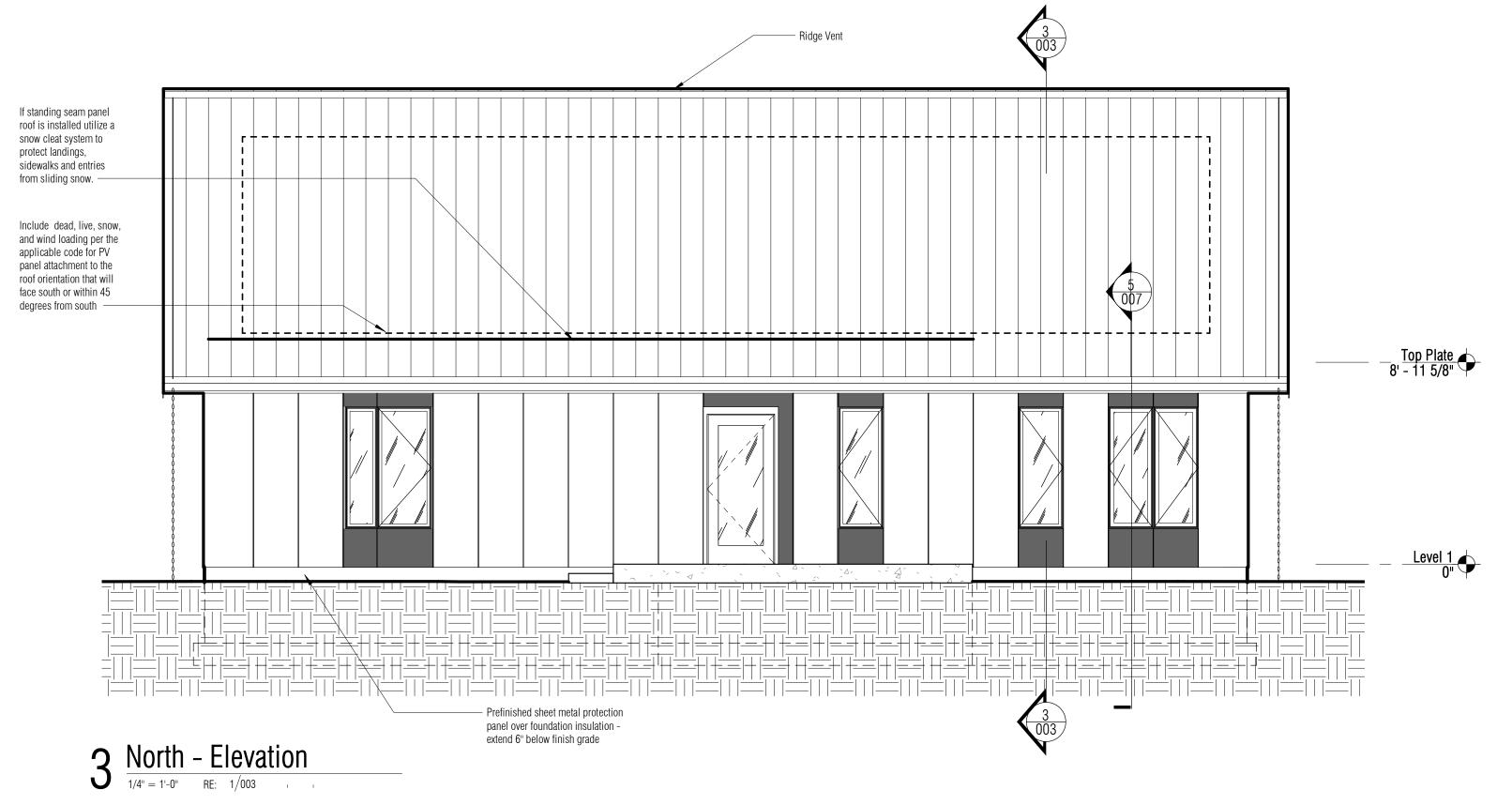
lowa Economic Development Authority

Project No: 20023.00



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slab-on-grade

O04 Elevations - 2 bedroom
Slab-on-grade

O05 Plan / Sections - 4 bedroom
occupied attic

O06 Elevations - 4 bedroom
occupied attic

O07 Wall sections

O08 Wall types and basement
option

O09 Roof plan / site concept
O10 Development orientation
options

O11 Performance criteria
Green Streets / energy

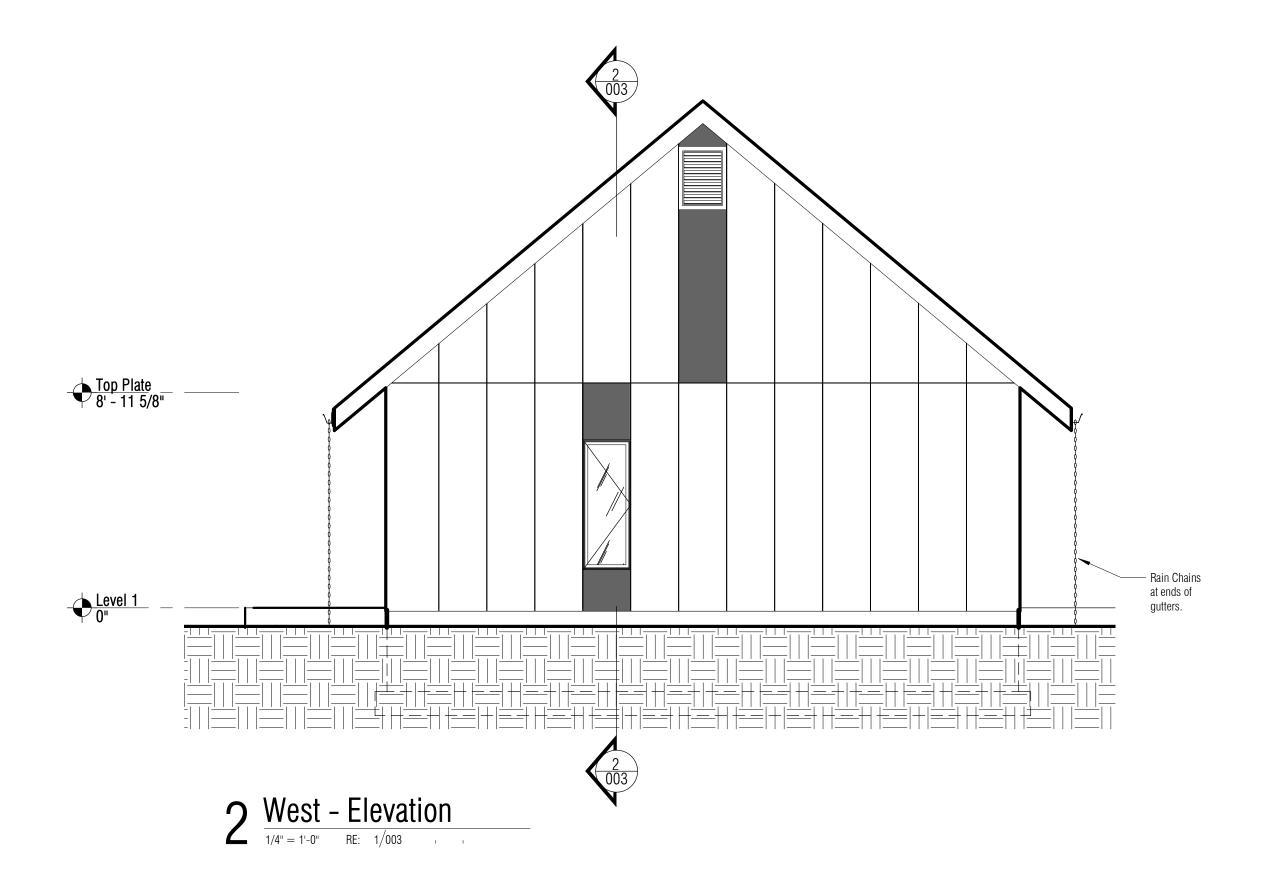
O12 Green Streets checklist
O13 Green Streets checklist

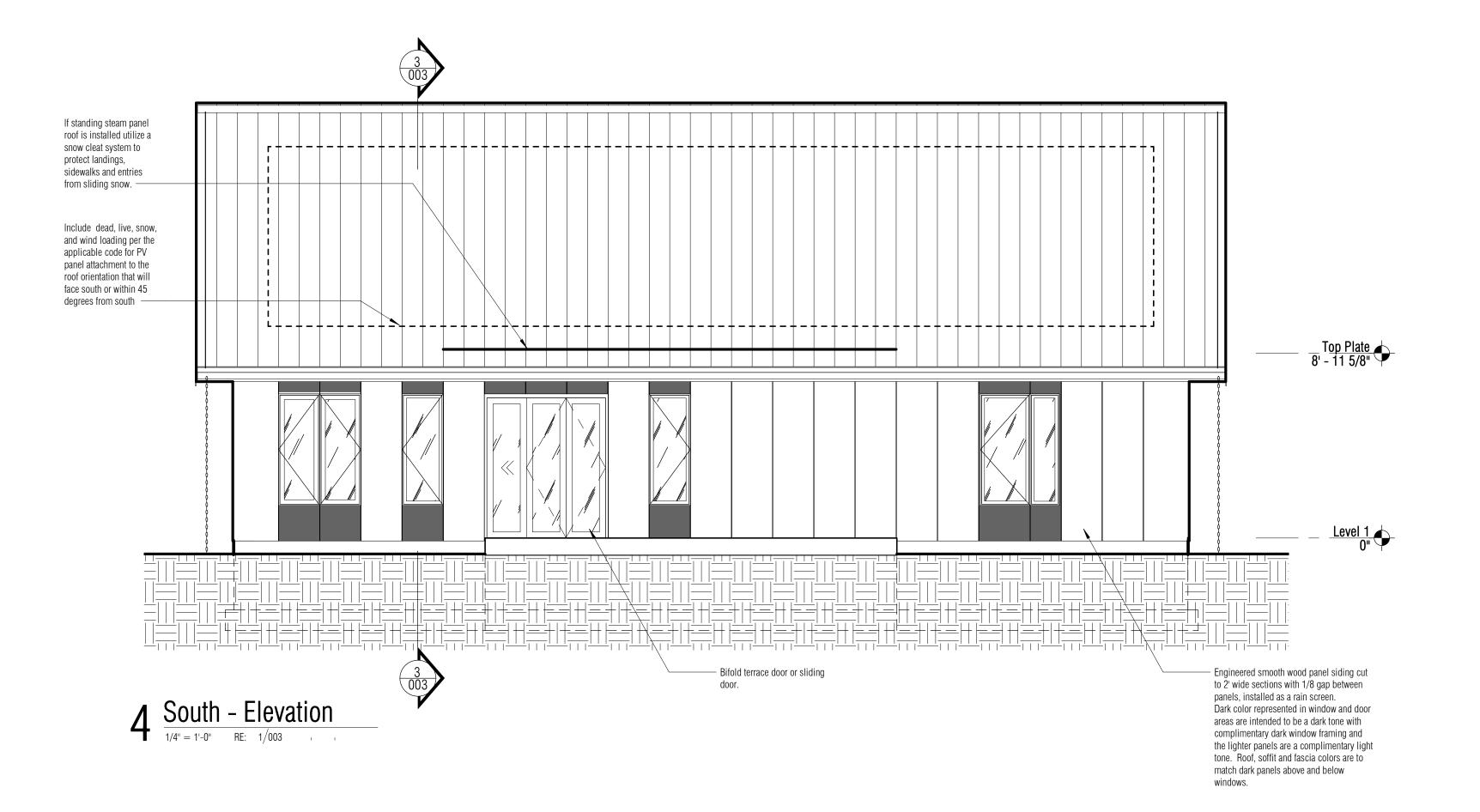
Green Streets checklist

Cover sheet

General notes

Plan / Sections - 2 bedroom





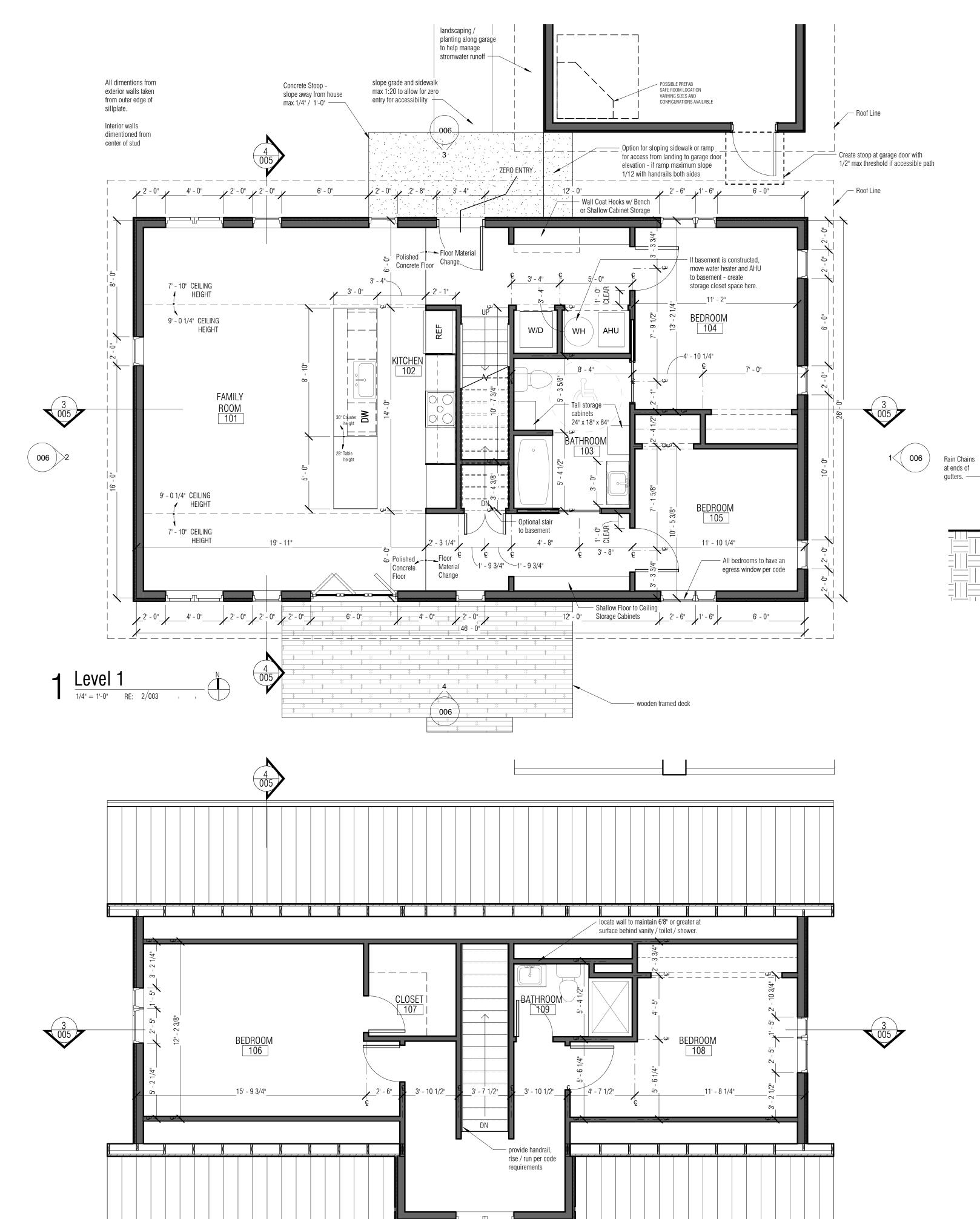
Schematic Design Documents

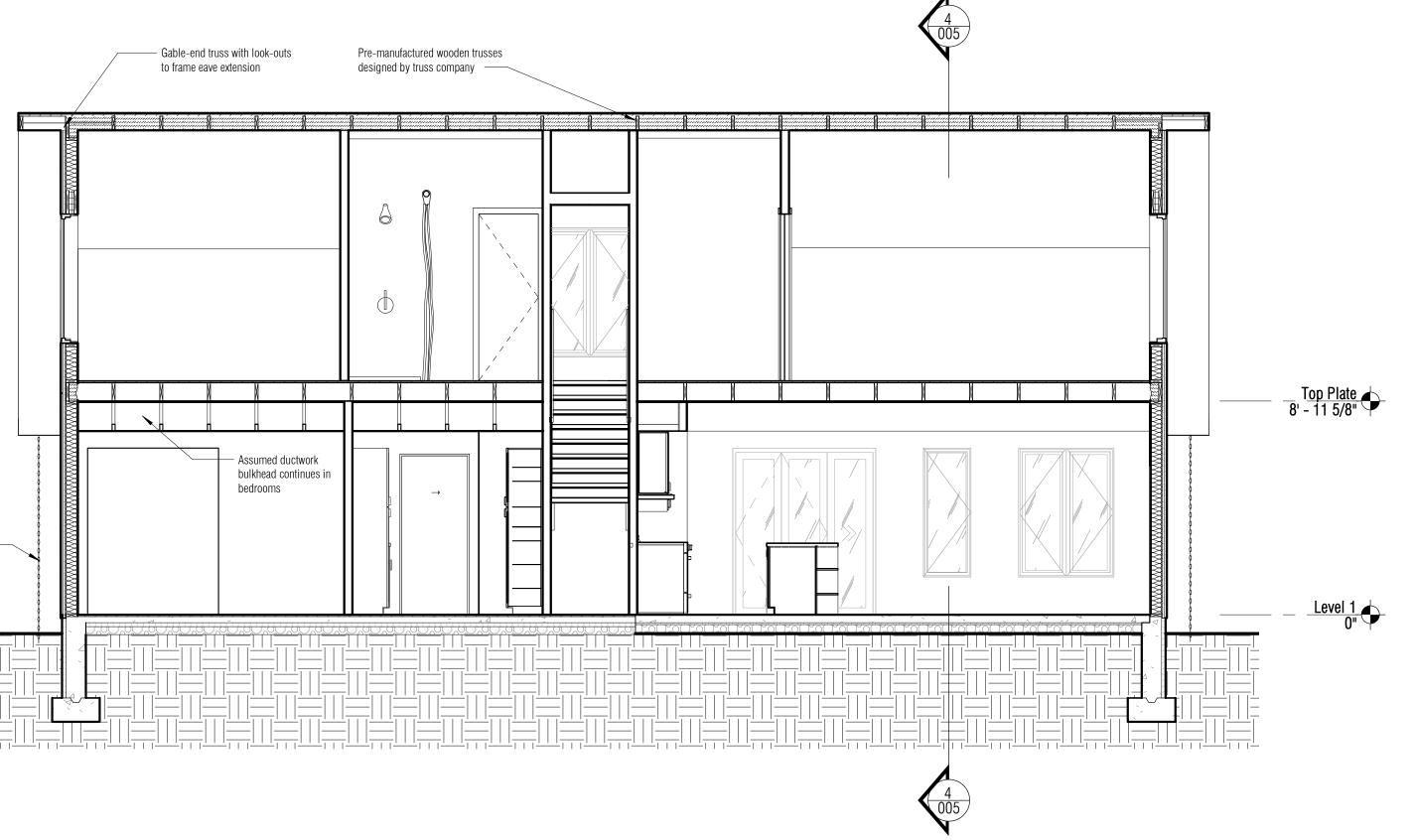
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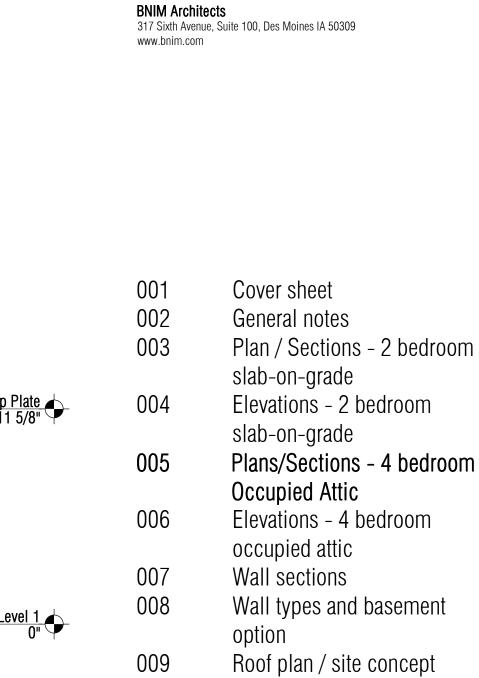
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May 1, 2021	
1 Story Option Elevations	
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Schematic Design Documents

Development orientation

Performance criteria

Green Streets / energy

Green Streets checklist

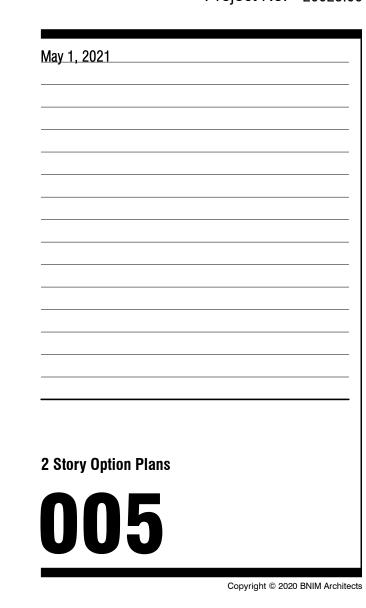
Green Streets checklist

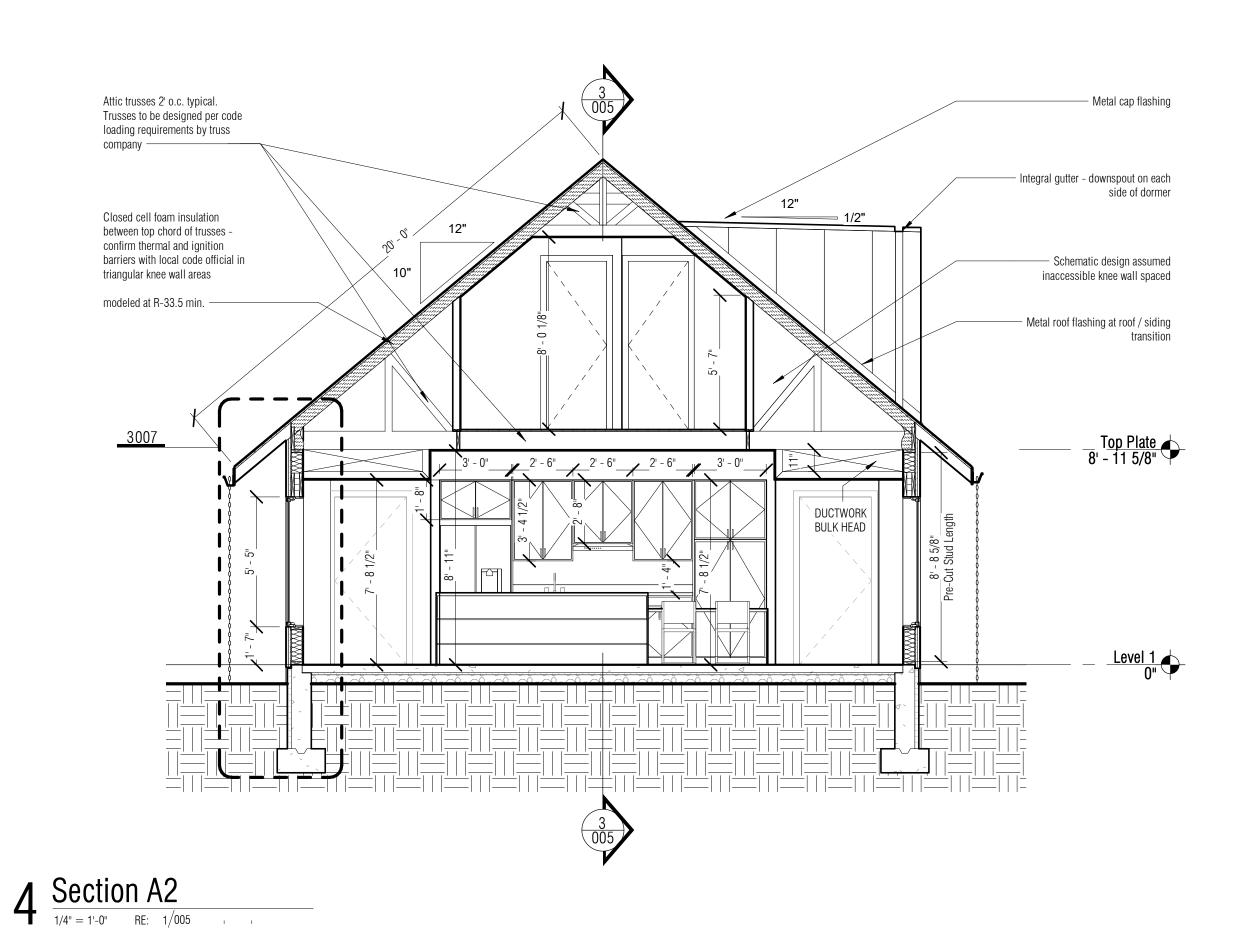
Green Streets checklist

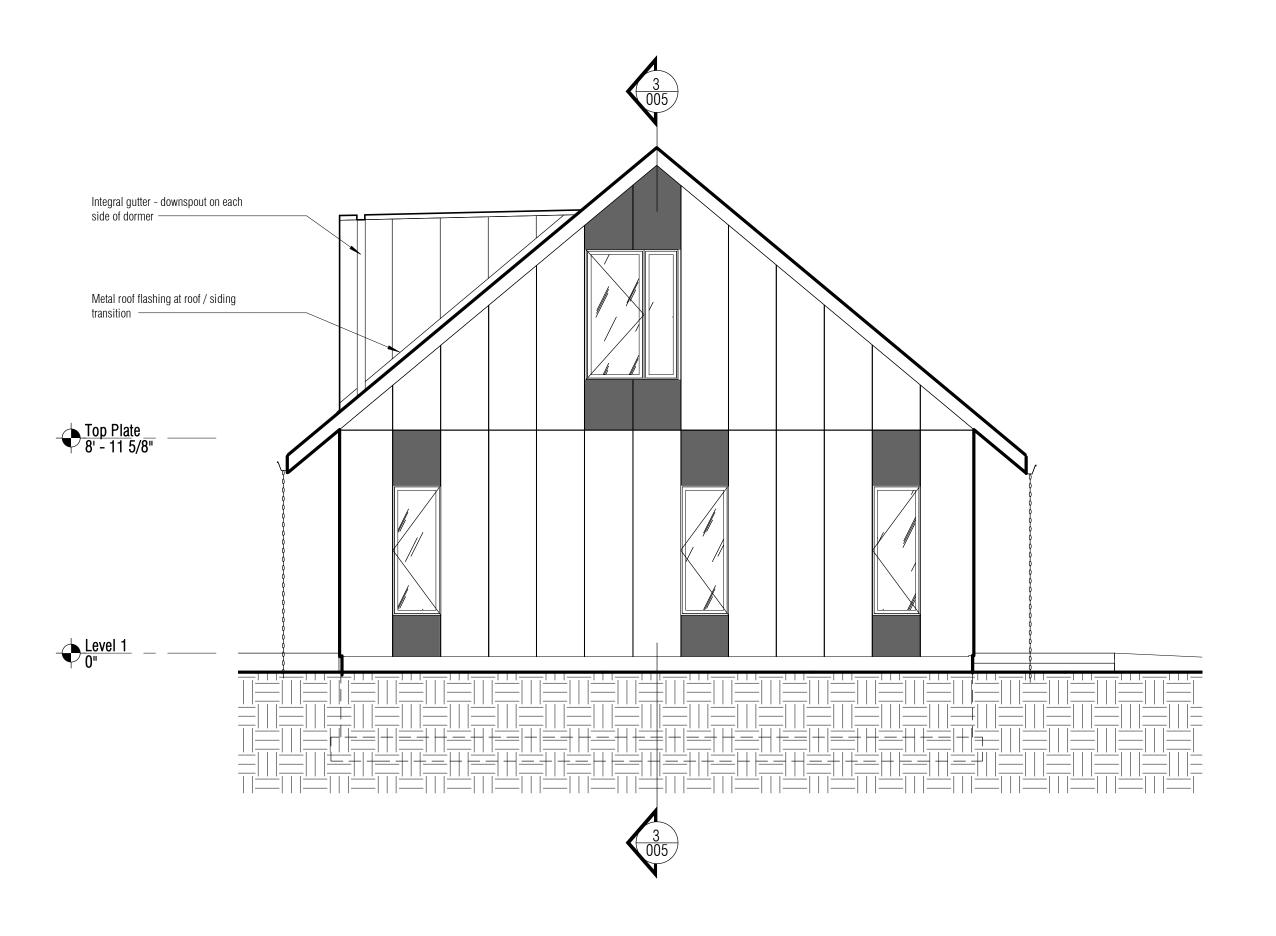
Iowa - High Performance Prototype Home

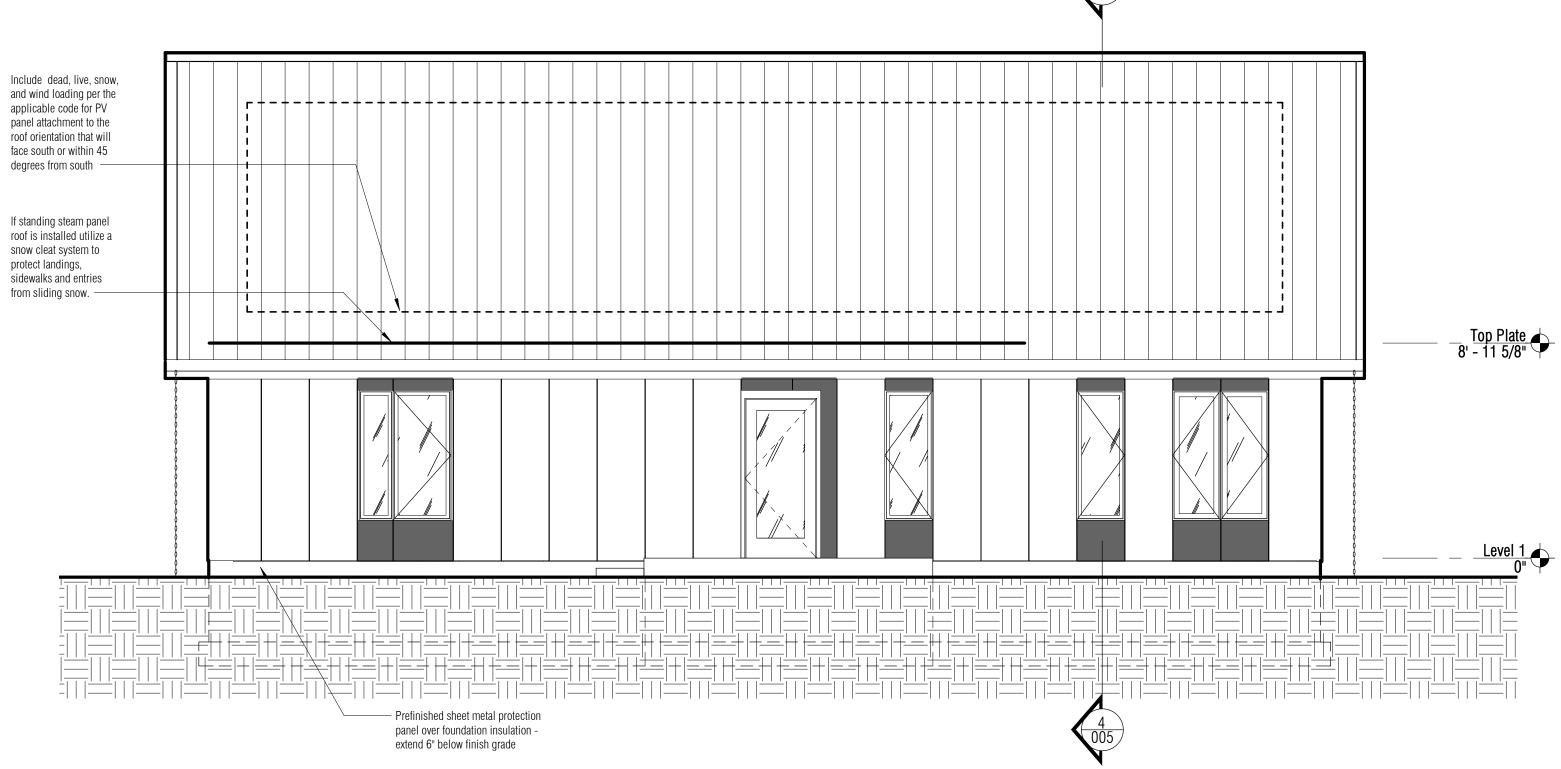
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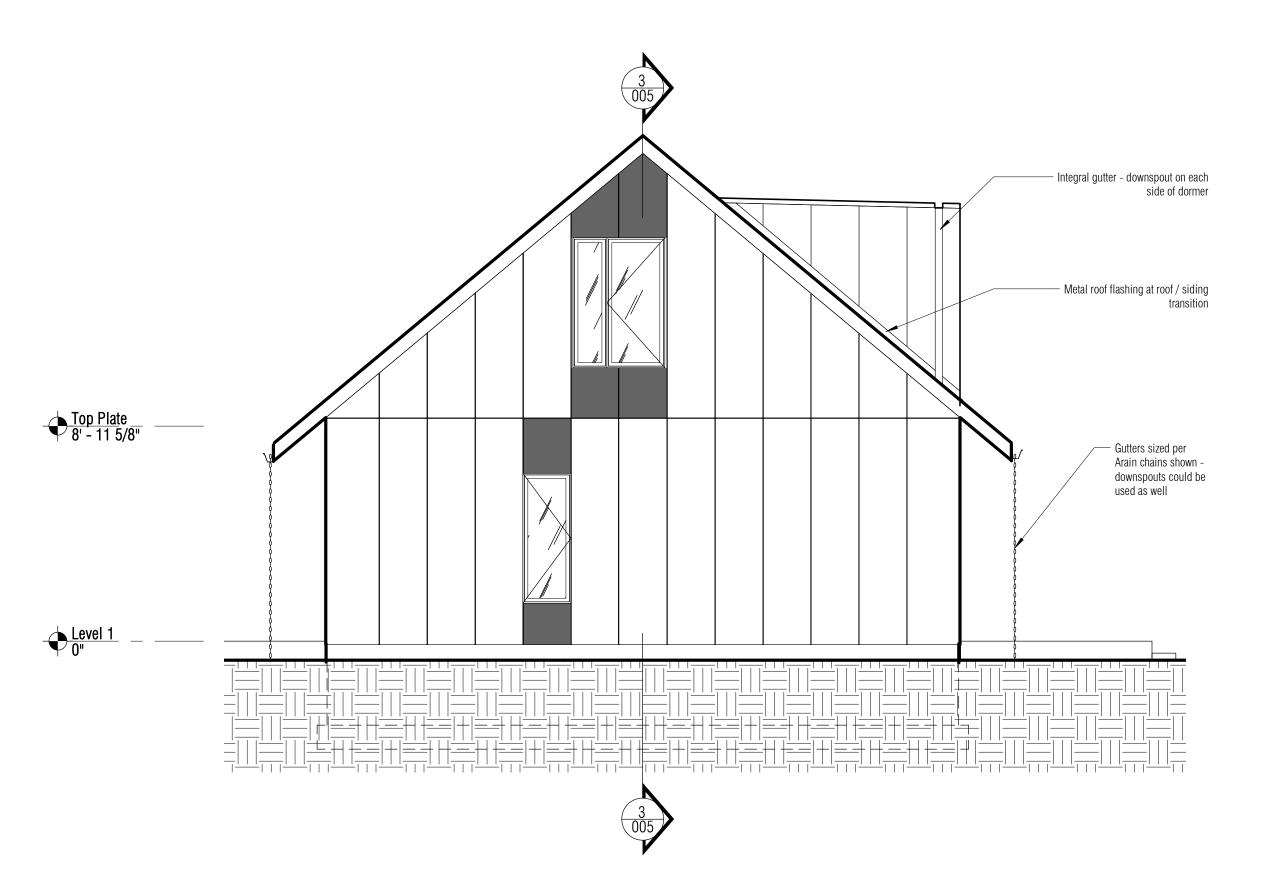




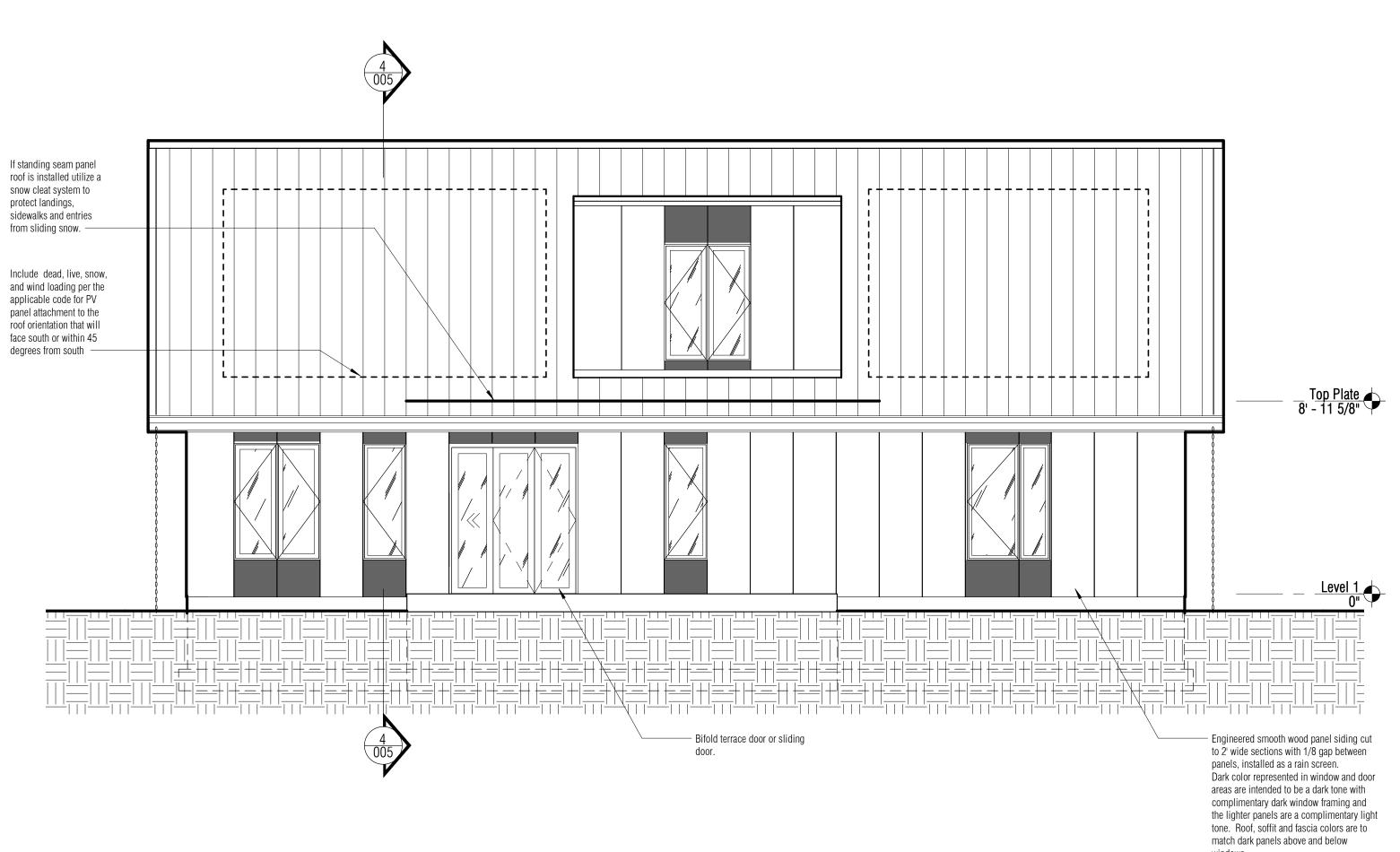
1 East Elevation $\frac{1}{1/4" = 1'-0"}$ RE: $\frac{1}{0.05}$

 $2 \frac{\text{West Elevation}}{\frac{1}{4"} = \frac{1}{0}} = \frac{1}{005}$

 $3 \frac{\text{North Elevation}}{\frac{1}{4"} = \frac{1}{0}} \frac{\text{RE: } 1/005}{\text{RE: } 1/005}$



4 South Elevation $\frac{1}{4} = 1 - 0$ RE: $\frac{1}{005}$





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001	Cover	sheet
	_	

002 General notes

Plan / Sections - 2 bedroom

slab-on-grade

4 Elevations - 2 bedroom

slab-on-grade Plan / Sections - 4 bedroom

occupied attic

Elevations - 4 bedroom

Occupied Attic

07 Wall sections

008 Wall types and basement

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10 Development orientation

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Green Streets checklist

4 Green Streets checklist

Schematic Design Documents

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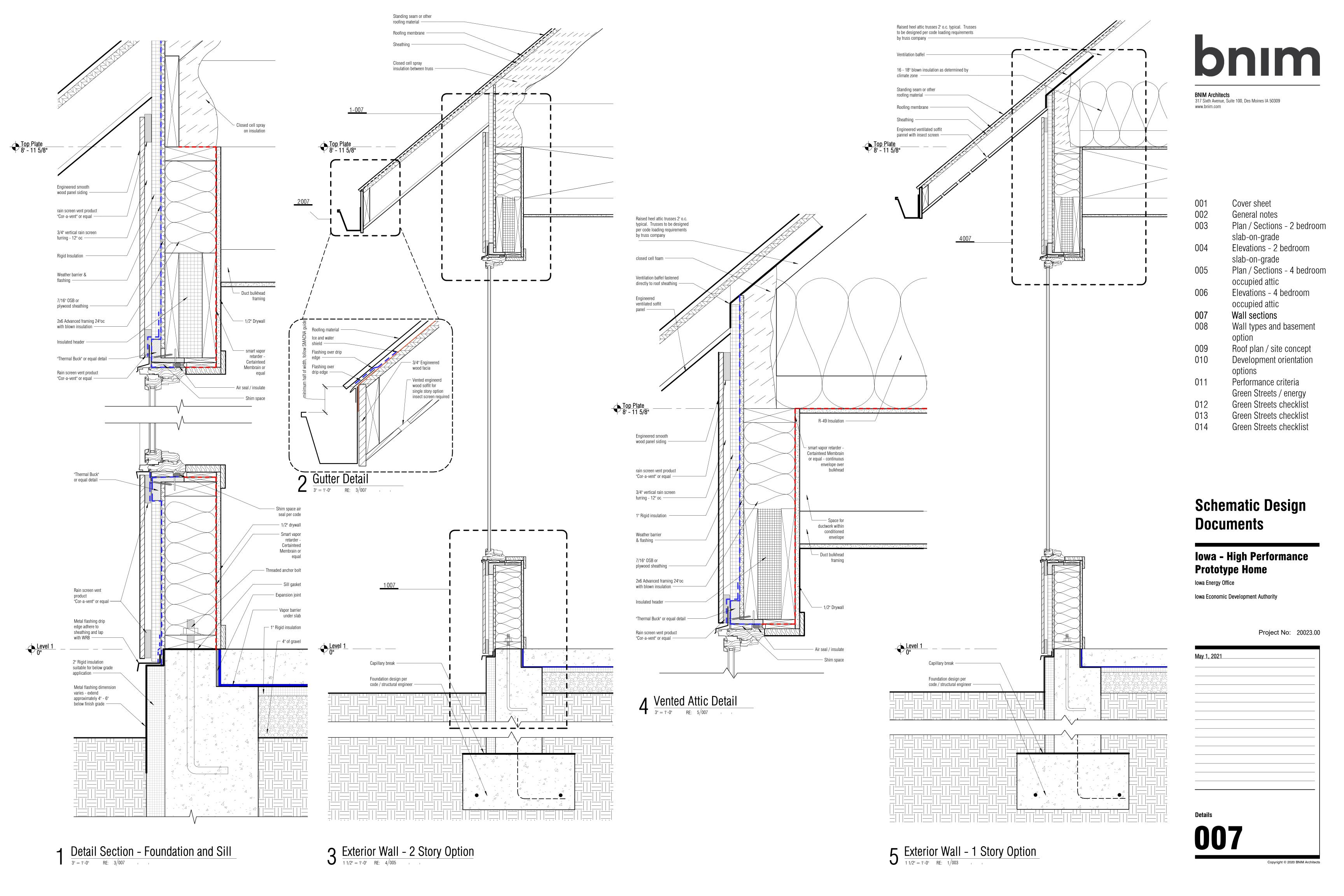
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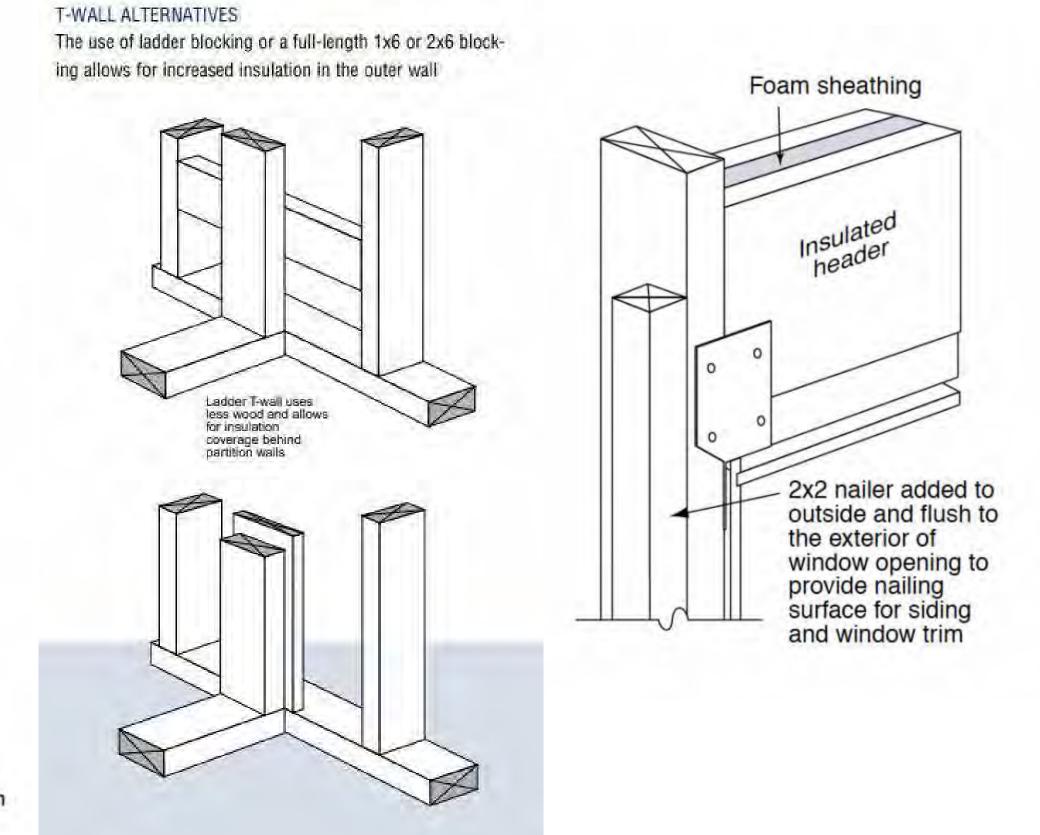
Project No: 20023.00

May 1, 2021		
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2 Story Option Elevati	ions	
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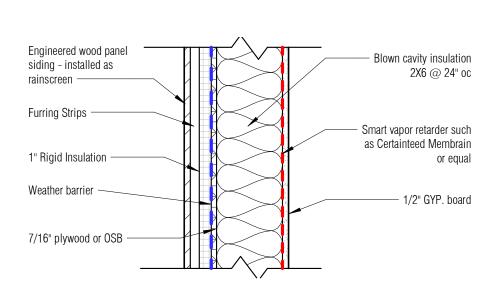
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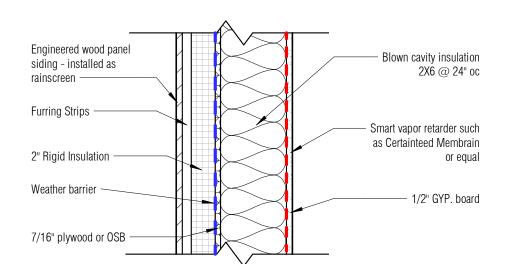
INSIDE "TWO-STUD" CORNERS Position clip support for gypsum board so that it does not interfere with trim nailing Backer support for gypsum board The first drywall sheet is installed against side with clip or backer



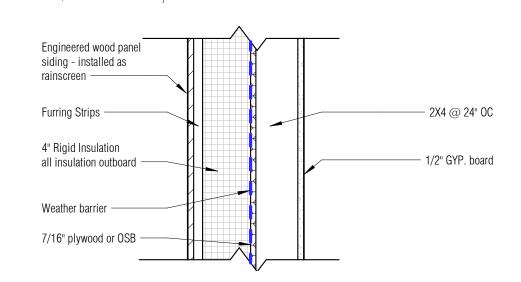
Advanced Framing Details - Example Details can be found on www.buildingscience.com and DOE Building America Website



Wall Type A - Home Plans as drawn

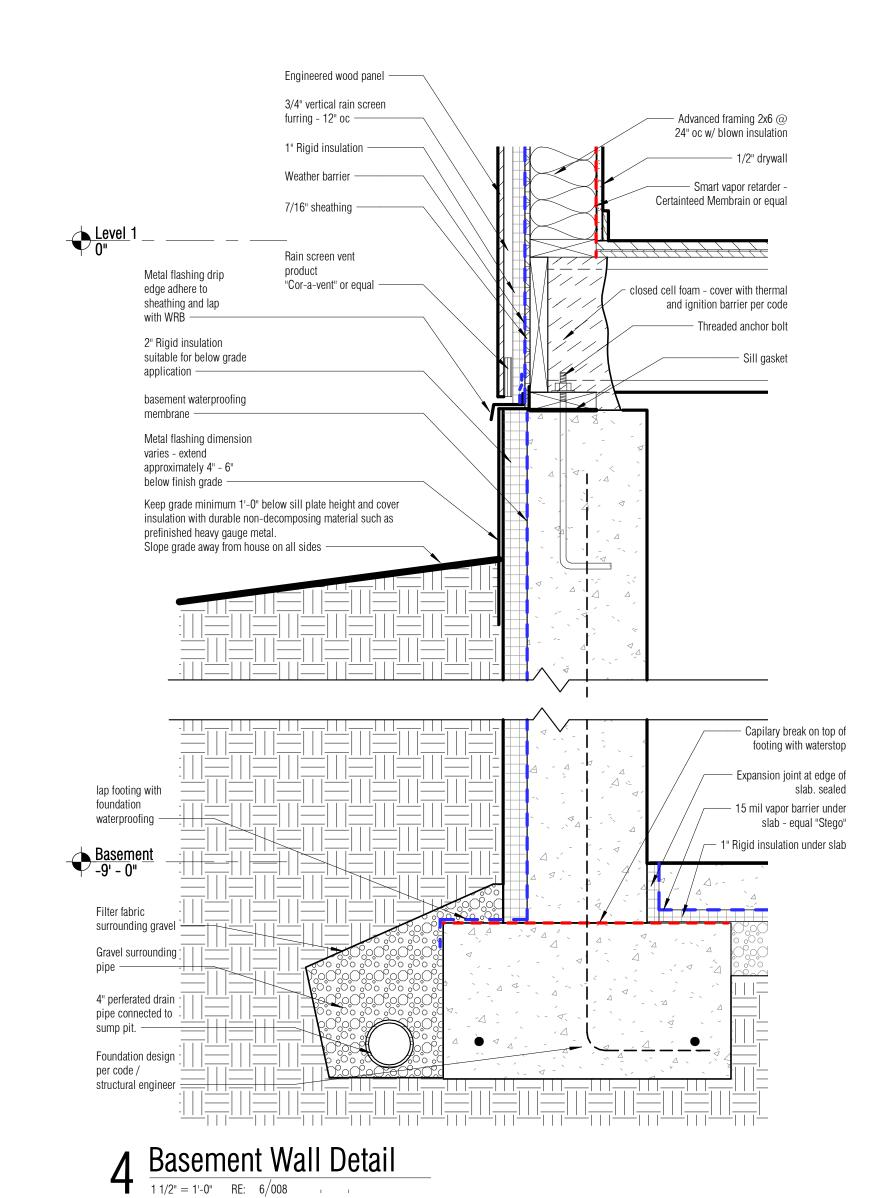


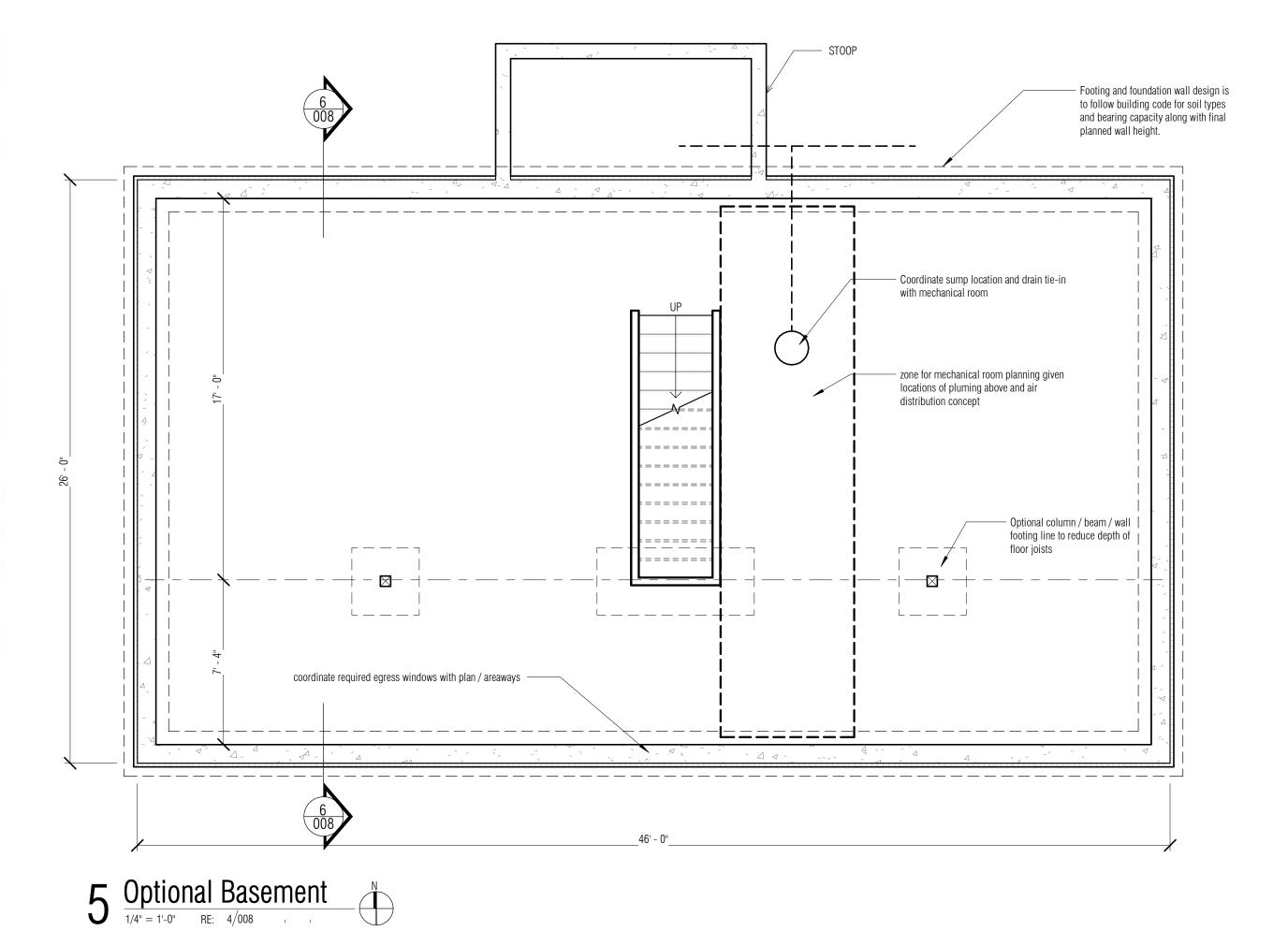
2 Wall Type B - High Performance Option

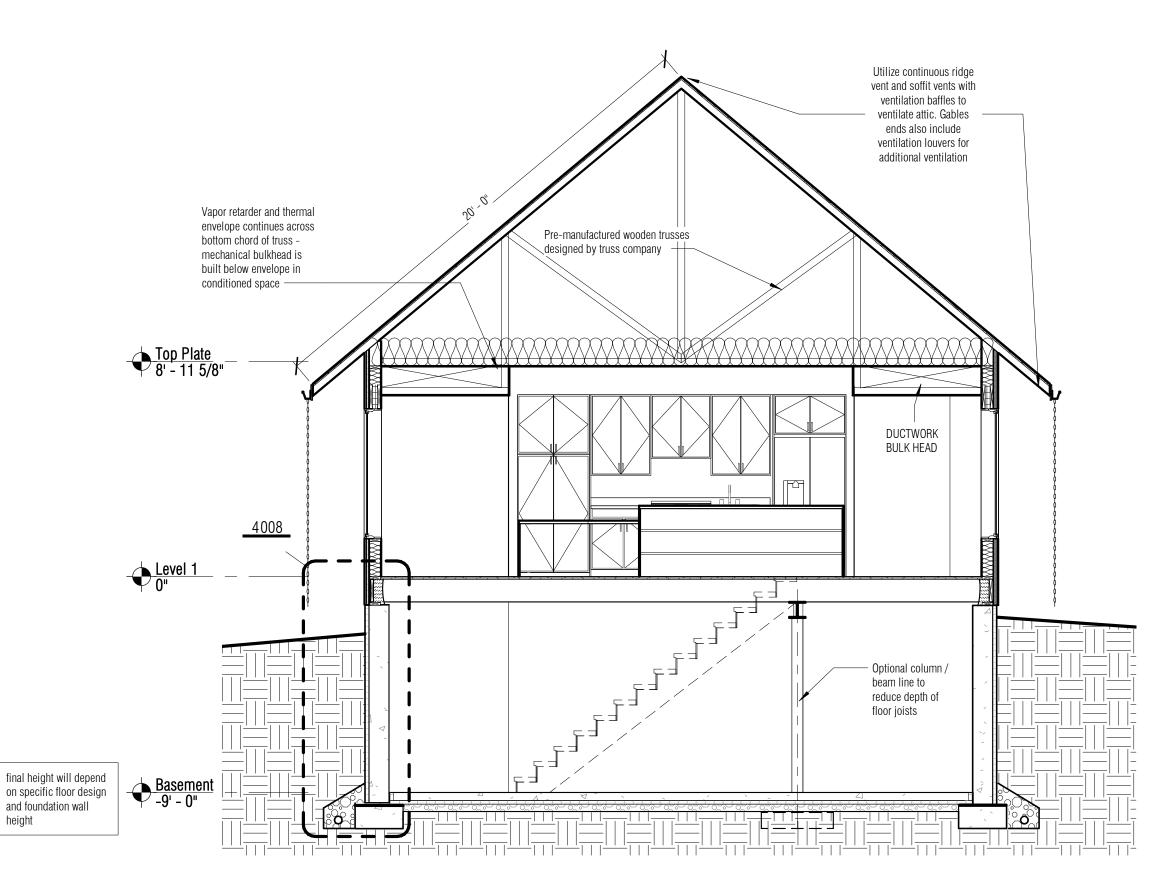


3 Wall Type C - High Performance Option

1 1/2" = 1'-0" RE: /







6 Section Basement

1/4" = 1'-0" RE: 5/008



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Cover sheet

General notes Plan / Sections - 2 bedroom

slab-on-grade

Elevations - 2 bedroom slab-on-grade

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Iowa - High Performance Prototype Home

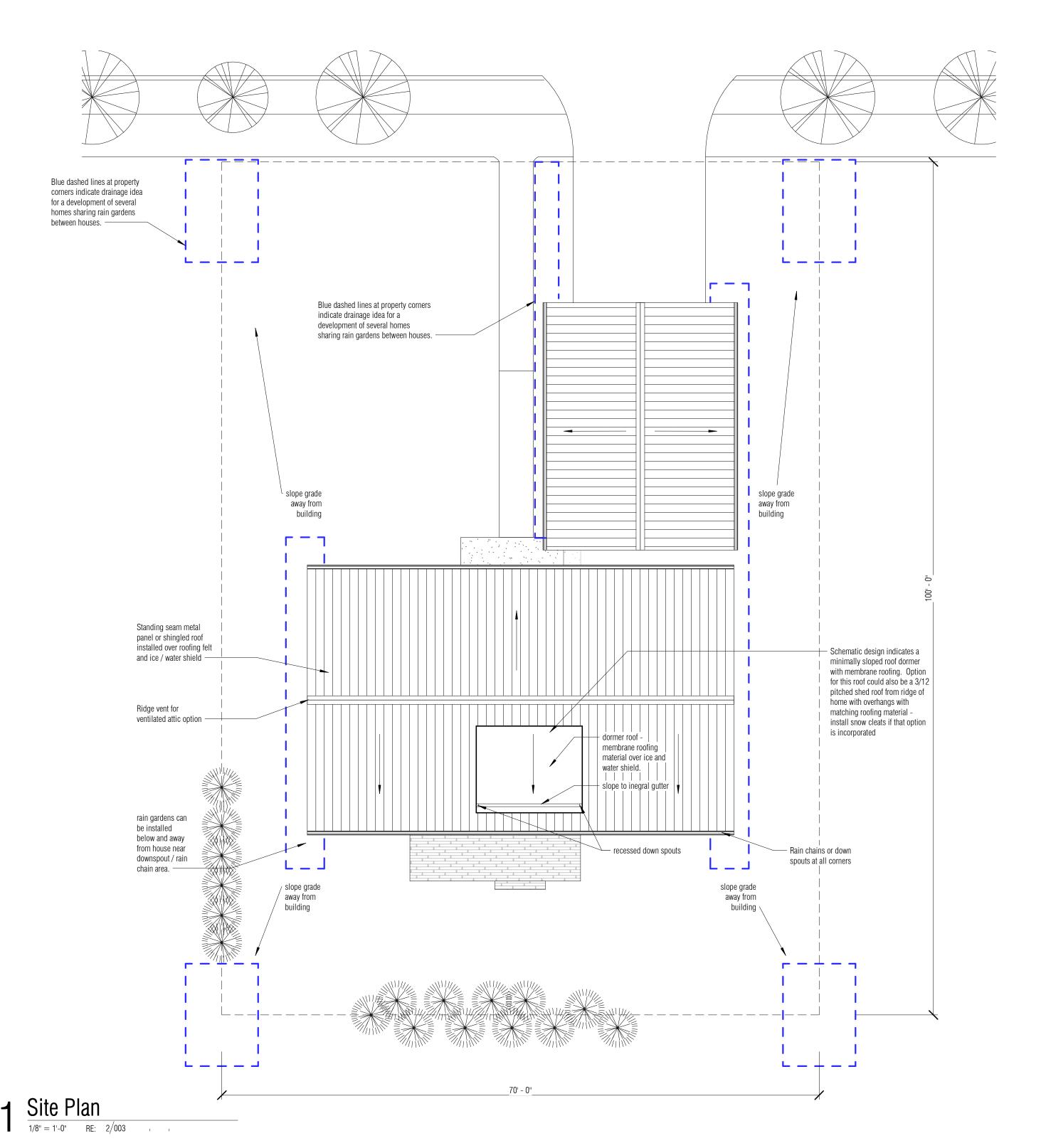
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May 1, 2021	
Basement and Wall Options	
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Stormwater management notes:

- A. Follow the best management practices and universal sizing criteria for rain gardens found in the Iowa Rain Garden Design and Installation Manual and the Iowa Stormwater Management Manual at website links below:
 - a. Iowa Stormwater Management Manual
 - b. Iowa Rain Garden Design & Installation Manual
- B. Main strategy shown on this typical site configuration is to slope site away from house foundation and if a new development rain gardens could be location to share at the property lines / corners and drain all lot stormwater
- C. The rain gardens could also be sized and located to intercept roof water closer to the home from rain chains or downspouts - (away from the foundation).
- D. The configuration shown also assumes a landscaped rain garden to intercept garage roof water and to avoid icing on the entry sidewalk.





IMPACTS OF STORMWATER

During storms, impervious surfaces such as roadways, parking lots and compacted soils cause accumulated pollutants to flow into storm drains without treatment. The contaminated water then makes its way into streams and rivers.

Rainwater should naturally soak into the soil to be filtered, but impervious areas prevent that from happening. This causes an increase in the volume and rate of polluted stormwater runoff into local waterbodies. As communities grow, they often experience even more stormwater runoff problems.





Without proper stormwater management, developed areas negatively impact their surroundings. There is increased water runoff which damages stream channels, pollutes water resources, and causes flooding.

Stormwater from roads and buildings can impact private property. Unlike common public infrastructure such as roads, sewers, or electricity, stormwater is often left for citizens to repair when damage occurs on private property.

UPDATED DESIGN STRATEGIES designed to:

drainage in oper reduce flow of reduce pollutants

 reduce flooding This approach is used with management of both small and large improve water quality

reduce water quantity

WATER QUALITY PROTECTION Small Storms These are methods that

target the small rainfall events. They provide treatment for the dirtiest portion of the runoff. The methods will help water soak into the ground, limit runoff in small rains, and reduce runoff that is causing erosion and damage in streams.



FLOOD PROTECTION Large Storms

These are methods to manage the large and infrequent storms that cause infrastructure damage and the catastrophic floods that threaten public safety.



UNIFIED SIZING CRITERIA

Unified Sizing Criteria is a comprehensive approach to design stormwater management systems.

It uses measurement standards to meet flooding, health, safety, and water quality goals. These criteria are used to design best management practices that meet desired treatment



OBJECTIVES OF UNIFIED SIZING CRITERIA

The Unified Sizing Criteria is used to manage stormwater with engineering techniques that protect our streams, rivers, and lakes. This approach mimics how lowa's original native prairie landscape and soils were able to soak in rainfall.







Permeable pavers (top) and bioretention cells (bottom) also soak in rainfall and manage stormwater where it falls instead of

SMALL STORM Criteria for Water Quality:

LARGE STORM Criteria for Water Quantity:

- **▲ RECHARGE VOLUME** (Rev)
- Absorbs rainfall and
- replenishes groundwater

Reduces surface runoff and

improves stream low-flow • Infiltrates or reuses up to

OVERBANK FLOOD

Reduces streams from

within communities

10-year storm

overflowing their banks

Reduces local flash flooding

from overloaded storm drains

Manages approximately 3.0"to

4.5" rainfall from a 2-year to

PROTECTION (Qp)

- 1.0" of rainfall
- WATER QUALITY VOLUME (WQv)
 - Captures runoff from the most common storm events
 - Provides water quality treatment and reduced pollutant loads

EXTREME FLOOD

infrastructure

a 100-year storm

PROTECTION (Qf)

Prevents flood damage to

elevation during a flood

Manages up to and beyond

(approximately 8.0" rain)

downstream properties and

· Prevents increases in high water

- This amount of runoff results from a 1.25" rainfall (includes 90% of all storms in lowa)
- CHANNEL PROTECTION VOLUME (CPv)
- Stabilizes streams by reducing flow rates and stream erosion
- Slowly releases the amount of rainwater from a 1-year storm over 24 hours (approximately 2.7" rain)

For more information, refer to:

Manual (ISWMM) – a statewide stormwater resource that provide design information on the Unified

Visit this site to view the ISWMM: www.iowadnr.gov/Environmental Protection/Water-Quality/NPDEStorm-Water/Storm-Water-Manual







Plan / Sections - 4 bedroom occupied attic

Elevations - 4 bedroom

Cover sheet

General notes

slab-on-grade

slab-on-grade

Plan / Sections - 2 bedroom

Elevations - 2 bedroom

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317 Sixth Avenue, Suite 100, Des Moines IA 50309

- occupied attic Wall sections
- Wall types and basement
- Roof plan / site concept
- Development orientation options
- Performance criteria
- Green Streets / energy Green Streets checklist
- Green Streets checklist
- Green Streets checklist

Schematic Design **Documents**

Iowa - High Performance Prototype Home

Iowa Energy Office

Iowa Economic Development Authority

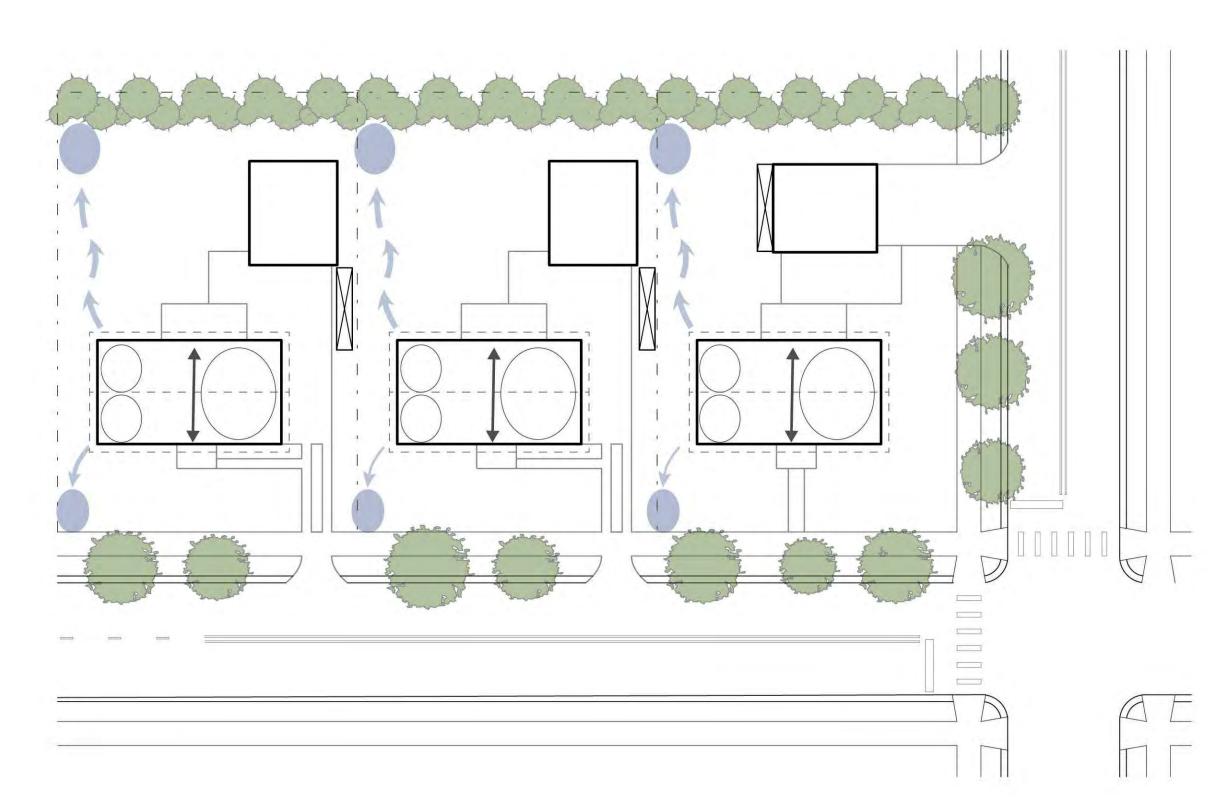
Project No: 20023.00

May 1, 2021			

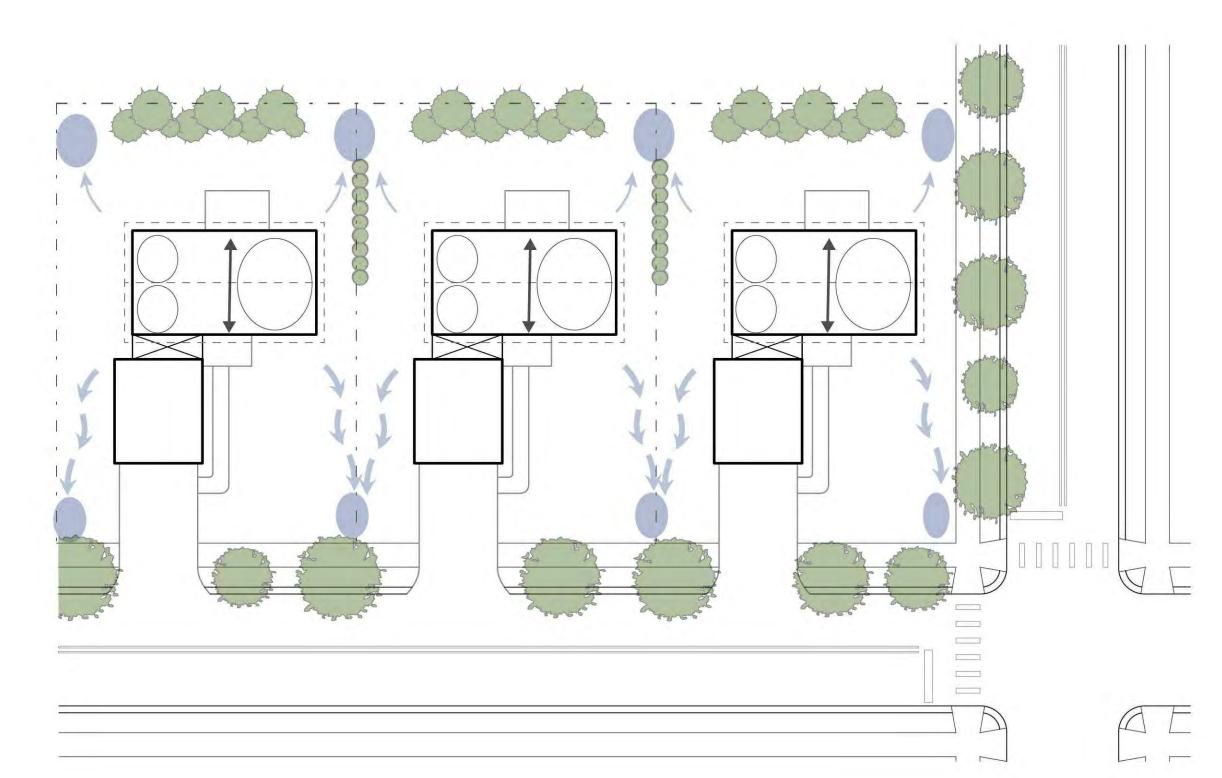
Site Plan

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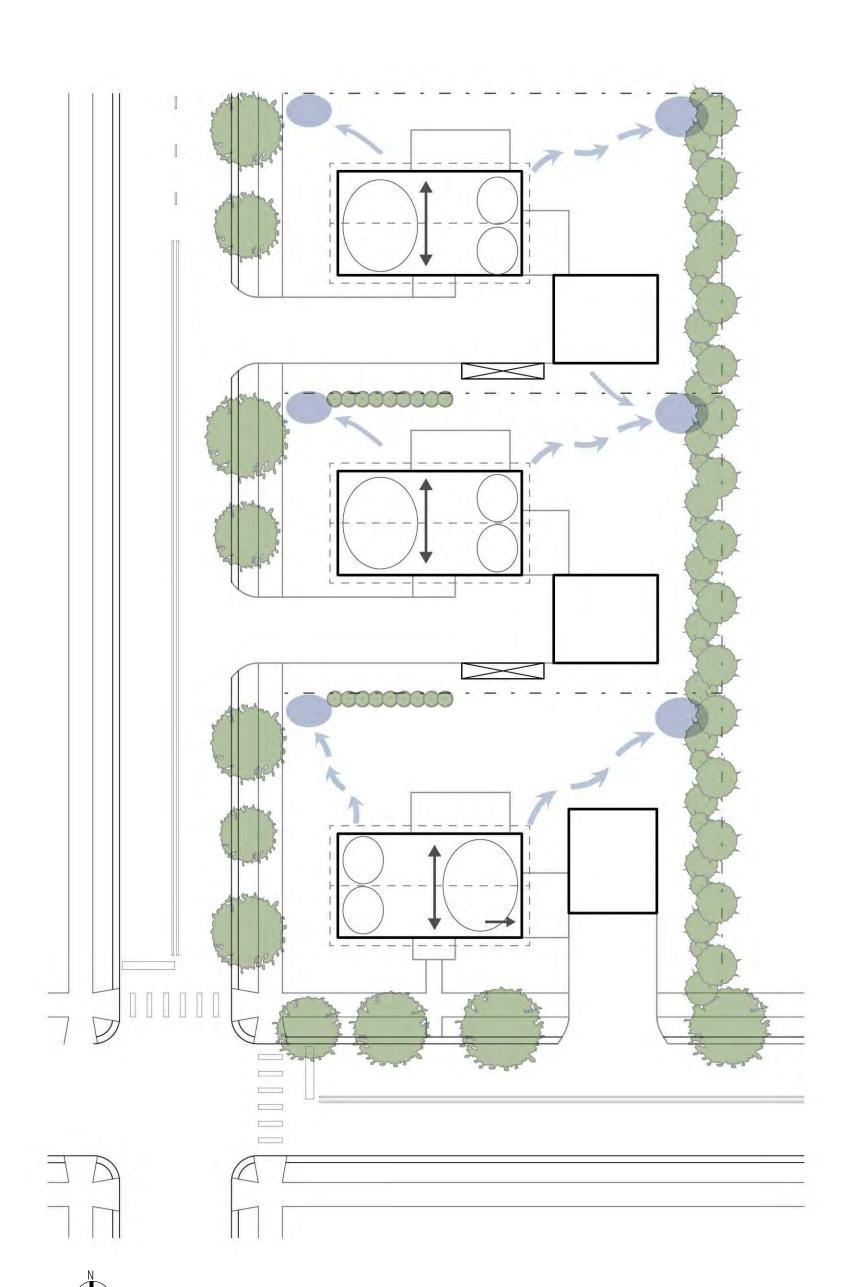
Site Plan Options











- 1. This sheet indicates diagrammatic options for how the home could be arranged in various configurations in a development for different street configurations.
- 2. The home plans could be slipped or mirrored to orient the front door to the street and windows can be moved within the prototype module.
- 3. In all cases the window fenestration should stay at or below 15% window to floor area with exceptions noted in the DOE ZERH Program. And, windows should be minimized on the east / west / north elevations and maximized on the southern exposure.
- 4. When siting the building or buildings, a storm water strategy should be to minimize impervious area on the property. Pervious paver sidwalks, driveways, and patios should be considered to manage a minimum of 1.25" rain event on the property.
- 5. Considerations should be given for PV roof mounted installation with considering tree placement and future growth / shade of the property and home. Trees should be located to minimize future shading of installed PV panels, but species could be investigated to maximize their growth to shade walls in the summer, but allow solar access to the roof PV panels year round



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- 01 Cover sheet
- O2 General notes
- Plan / Sections 2 bedroom
- slab-on-grade
- Elevations 2 bedroom
- slab-on-grade D5 Plan / Sections - 4 bedroom
- occupied attic
- D6 Elevations 4 bedroom
- occupied attic
- Wall sections
- Wall types and basement
- Roof plan / site concept
- Development orientation
- ontions
- Performance criteria
- Green Streets / energy
- 12 Green Streets checklist
- 3 Green Streets checklist
- 4 Green Streets checklist

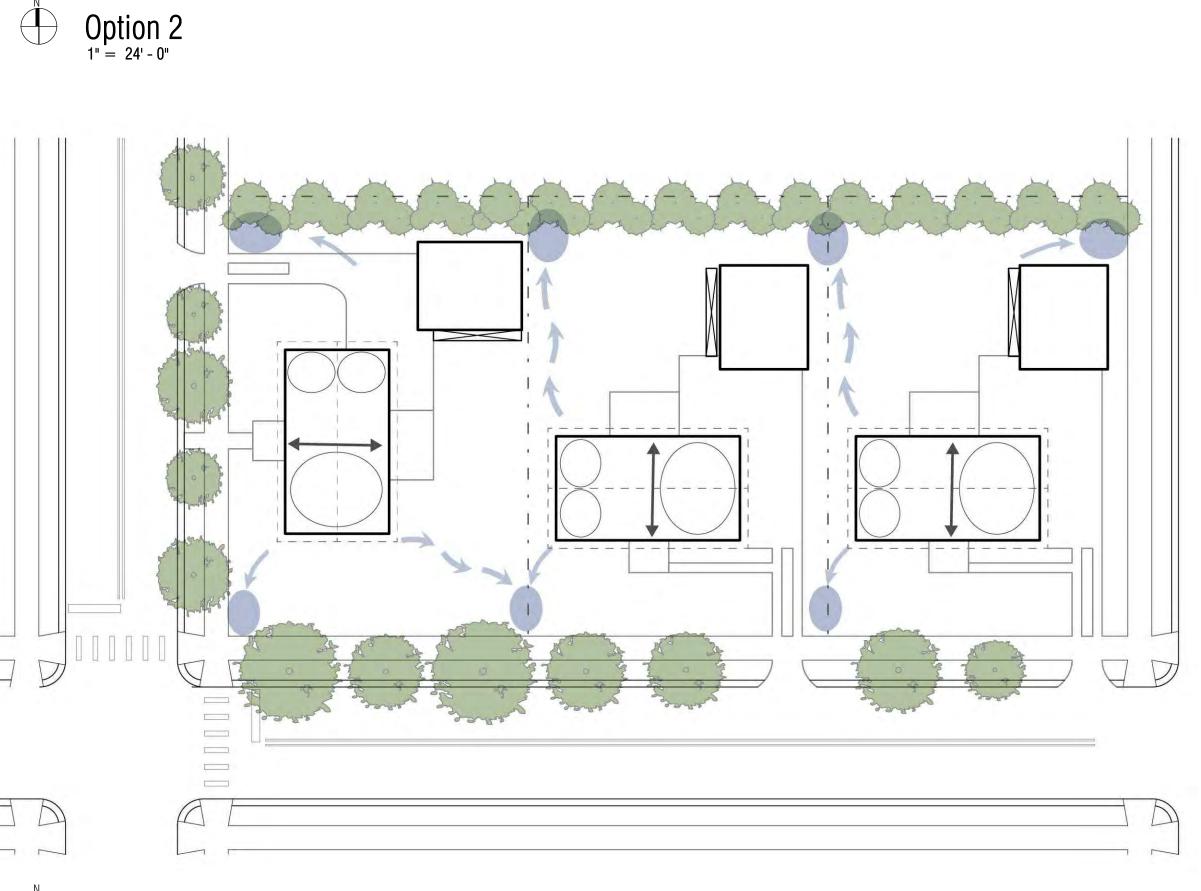
Schematic Design Documents

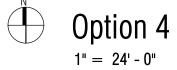
Iowa - High Performance Prototype Home

Iowa Energy Office

Iowa Economic Development Authority

ite Options		





2020 Iowa Green Streets Criteria Summary Items:

Please note – the following is a brief summary of highlights of items to consider for each category of the lowa Green Streets Criteria along with a summary checklist of each point in the system. This is not a comprehensive list. Please refer to the full Green Streets Document for descriptions, requirements, and related resources for each point. https://www.iowaeda.com/green-streets/after-2020/

1. INTEGRATIVE DESIGN:

- a. To maximize high-performance design, it is important to have all designers, engineers, contractors, subcontractors, and community members / homeowners involved in the design refinement and construction processes making decisions together.
- b. Integrated design considers effective and frequent communication during all phases of the project design and construction.
- Consider resilient design strategies to minimize climate related risks.

2. LOCATION + NEIGHBORHOOD FABRIC

- a. Locate site for construction that does not negatively impact sensitive sites such as:
 - i. Agricultural farmland
 - ii. Wildlife habitats
 - Wetlands and other ecosystems
 - iv. Floodplains
- b. Foster development in existing neighborhoods within a community.
 - Build utilizing existing infrastructure
 - ii. Foster density / infill in communities in lieu of expanding development in surrounding farmland
- iii. Locate properties that encourage accessible pedestrian connections to community services / amenities
- Foster connectivity / community
 - Connect to recreation / trail systems
 - ii. Foster local food access
 - iii. Provide broadband connectivity
 - iv. Utilize local / regional contractors / material suppliers
 - v. Consider development that has solar access for PV installations and if developing more than one home, consider district (shared) geothermal systems for a larger multi-home development

3. SITE IMPROVEMENTS

a. Construction:

- i. Minimize site development to only what is needed for construction and storm water management.
- ii. Secure NPDES permits as required by IDNR
- iii. Develop and implement a Storm Water Pollution Prevention plan as required
- iv. Protect trees and vegetation to remain

b. Landscape:

- i. Implement native / climate appropriate landscaping
- 1. Baseline Energy Model: Each Option / concept has a Baseline Energy Model created for a current code-compliant home in Iowa. As of May 1, 2021 the adopted code in Iowa is the 2012 IECC with amendments.
- R-10 perimeter (2' deep), 80 AFUE Gas Furnace (60 kbtu/h capacity), 13 Seer A/C 2 ton, 0.56 EF gas water heater, RESNET default appliance – gas where applicable, 75% LED's. 2. Option 1, 2, 3 Models: Conceptually these models modify key components and performance for

a. 4 ACH 50, Windows U-0.32, 2x6 wall, 16" oc, fiberglass batt, R-49 ventilated attic, slab on grade

- the 2018 IECC. All other items are unchanged. The items that change from the baseline are: a. 3 ACH 50, Window U-0.3, 2x6 Advanced Framing, Blown Fiberglass cavity-R-22.5 + R-5 CI, slab-
- on-grade also includes R-5 below slab, Energy Star Appliances gas included, 100% LED's, ductwork in conditioned space.
- 3. Option 1.1 Model: This modeled the Option 1 Scenario with the variation of 2" of insulating sheathing in lieu of 1".
- 4. Option 1A, 2A, 3A Models: These models only modify the exterior insulating sheathing thickness and cavity insulation. Cavity insulation is eliminated, 2x4 advanced framing is used, and 4" of rigid insulation is installed outboard of the sheathing.
- 5. Option 1B, 2B, 3B Models: These models utilize DOE ZERH Program Criteria. The following items are modified from the "A" options above:
- a. 2 ACH 50, All-electric home, Air Source Heat Pump (9 HSPF, 16 Seer), balanced ventilation w/recovery, 2.0 EF Heat pump water heater, Energy Star Appliances - all electric.
- 6. Results: The results indicate that the "B" scenarios meet the Green Streets and ZERH Program goals and given the modest improvements with 4" of insulating sheathing vs the 1" it appears the 1" or 2" insulating sheathing could be substituted in Options "B".

									www.pvwatts.nr					
Energy Info	rmation								PV system Energ	y Produc	ction			
Climate Zor	ne 5		Des Moine	s, Iowa						6kw	7kw	8kw	9kw	10kw
Model	HERS	Heating (kwh/yr)	Cooling (kwh/yr)	Water Heating (kwh/yr)	Lights and Appliances (kwh/yr)	Total (kwh/yr)	Monthly Average (kwh/yr)	% Energy Savings Over Baseline	kwh/yr	8636	10075	11514	12953	1439
Baseline 1	96	9525	1260	4132	6787	21704	1809		kwh/mo -avg	720	840	960	1079	119
Option 1	80	6360	1026	3810	5627	16823	1402	22.5%	area - sf	404	471	538	605	67.
Option 1.1	79	5920	1026	3810	5627	16383	1365	24.5%	Panels @ 300w	20	23	27	30	3
Option 1A	80	6272	1026	3810	5627	16735	1395	22.9%						
Option 1B	49	3839	615	879	3733	9066	756	58.2%						
Baseline 2	83	14888	1465	5568	7993	29914	2493							
Option 2	70	10052	1377	5099	6862	23390	1949	21.8%						
Option 2A	71	10697	1377	5099	6862	24035	2003	19.7%						
Option 2B	55	6858	879	1290	4857	13884	1157	53.6%						
Baseline 3	76	18962	1465	5568	8339	34334	2861							
	67	14654	1407	5187	8199	29447	2454	14.2%						
Option 3		4 4 4 4 4	1407	5187	8199	29359	2447	14.5%						
Option 3 Option 3A	67	14566	1407	2701										
Option 3A Option 3B	_	7503	879		6077	15778		54.0%	PV system Energ	gy Produc	ction			
Option 3A Option 3B	67 49 deling Inform	7503		1319	-			-	PV system Energ	gy Produc	ction 7kw	8kw	9kw	10kw
Option 3A Option 3B Energy Mod	67 49 deling Inform	7503	879	1319 Iowa Water Heating	-	15778		-	PV system Energ	Andrew S. Service	7kw	8kw	131	
Option 3A Option 3B Energy Mod Climate Zor	deling Informate 6	7503 mation Heating (kwh/yr)	Waterloo,	lowa Water Heating (kwh/yr)	6077 Lights and Appliances (kwh/yr)	15778 Total	Monthly Average	% Energy Savings Over		6kw	7kw	11226	12629	1403
Option 3A Option 3B Energy Mod Climate Zor Model	deling Informate 6	7503 nation Heating (kwh/yr) 12485	Waterloo, Cooling (kwh/yr)	lowa Water Heating (kwh/yr) 4396	6077 Lights and Appliances (kwh/yr)	15778 Total (kwh/yr)	Monthly Average (kwh/yr)	% Energy Savings Over	kwh/yr	6kw 8420	7kw 9823	11226	12629 1052	1403
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1	deling Informe 6 HERS	7503 nation Heating (kwh/yr) 12485 8440	Waterloo, Cooling (kwh/yr)	lowa Water Heating (kwh/yr) 4396 4015	Lights and Appliances (kwh/yr) 6759	15778 Total (kwh/yr) 24607	Monthly Average (kwh/yr) 2051	% Energy Savings Over Baseline	kwh/yr kwh/mo -avg	8420 702	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 116 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1	67 49 deling Informe 6 HERS	7503 nation Heating (kwh/yr) 12485 8440 7854	Waterloo, Cooling (kwh/yr) 967 762	lowa Water Heating (kwh/yr) 4396 4015	Lights and Appliances (kwh/yr) 6759 5663	Total (kwh/yr) 24607 18880	Monthly Average (kwh/yr) 2051 1573	% Energy Savings Over Baseline 23.3%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 116 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1.1	67 49 deling Informe 6 HERS 93 77	7503 nation Heating (kwh/yr) 12485 8440 7854 8499	Waterloo, Cooling (kwh/yr) 967 762 762	lowa Water Heating (kwh/yr) 4396 4015	Lights and Appliances (kwh/yr) 6759 5663 5663	Total (kwh/yr) 24607 18880 18294	Monthly Average (kwh/yr) 2051 1573 1525	% Energy Savings Over Baseline 23.3% 25.7%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 1169 67
Option 3A Option 3B Energy Moc Climate Zor Model Baseline 1 Option 1 Option 1A	67 49 deling Informe 6 HERS 93 77 75	7503 nation Heating (kwh/yr) 12485 8440 7854 8499 5363	Waterloo, Cooling (kwh/yr) 967 762 762 733	lowa Water Heating (kwh/yr) 4396 4015 4015 938	Lights and Appliances (kwh/yr) 6759 5663 5663	Total (kwh/yr) 24607 18880 18294 18910	Monthly Average (kwh/yr) 2051 1573 1525 1576	% Energy Savings Over Baseline 23.3% 25.7% 23.2%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 116 67
Option 3A Option 3B Energy Moc Climate Zor Model Baseline 1 Option 1.1 Option 1A Option 1B	67 49 deling Informe 6 HERS 93 77 75 76	7503 hation Heating (kwh/yr) 12485 8440 7854 8499 5363	Waterloo, Cooling (kwh/yr) 967 762 762 733 381	lowa Water Heating (kwh/yr) 4396 4015 4015 938 5803	Lights and Appliances (kwh/yr) 6759 5663 5663 4073	Total (kwh/yr) 24607 18880 18294 18910 10755	Monthly Average (kwh/yr) 2051 1573 1525 1576 896	% Energy Savings Over Baseline 23.3% 25.7% 23.2%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 1169 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1.1 Option 1A Option 1B Baseline 2	67 49 deling Informe 6 HERS 93 77 75 76 50	7503 hation Heating (kwh/yr) 12485 8440 7854 8499 5363 17086 13393	879 Waterloo, Cooling (kwh/yr) 967 762 762 733 381 1465	iowa Water Heating (kwh/yr) 4396 4015 4015 938 5803 5480	Lights and Appliances (kwh/yr) 6759 5663 5663 5663 4073 7975	Total (kwh/yr) 24607 18880 18294 18910 10755 32329	Monthly Average (kwh/yr) 2051 1573 1525 1576 896 2694	\$4.0% % Energy Savings Over Baseline 23.3% 25.7% 23.2% 56.3%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 116 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1A Option 1B Baseline 2 Option 2	67 49 deling Informe 6 HERS 93 77 75 76 50 83	7503 nation Heating (kwh/yr) 12485 8440 7854 8499 5363 17086 13393 14214	Waterloo, Cooling (kwh/yr) 967 762 762 733 381 1465	iowa Water Heating (kwh/yr) 4396 4015 4015 938 5803 5480	Lights and Appliances (kwh/yr) 6759 5663 5663 5663 4073 7975 6927	Total (kwh/yr) 24607 18880 18294 18910 10755 32329 26826	Monthly Average (kwh/yr) 2051 1573 1525 1576 896 2694 2236	\$4.0% % Energy Savings Over Baseline 23.3% 25.7% 23.2% 56.3%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 1169 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1A Option 1B Baseline 2 Option 2 Option 2 Option 2	67 49 deling Informe 6 HERS 93 77 75 76 50 83 67	7503 hation Heating (kwh/yr) 12485 8440 7854 8499 5363 17086 13393 14214 9671	Waterloo, Cooling (kwh/yr) 967 762 762 733 381 1465 1026 1055	1319 Water Heating (kwh/yr) 4396 4015 4015 938 5803 5480 5480 1436	Lights and Appliances (kwh/yr) 6759 5663 5663 5663 4073 7975 6927	Total (kwh/yr) 24607 18880 18294 18910 10755 32329 26826 27676	Monthly Average (kwh/yr) 2051 1573 1525 1576 896 2694 2236 2306	\$4.0% % Energy Savings Over Baseline 23.3% 25.7% 23.2% 56.3% 17.0% 14.4%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 116 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1A Option 1B Baseline 2 Option 2 Option 2 Option 2A Option 2B	67 49 deling Informe 6 HERS 93 77 75 76 50 83 67 69	7503 nation Heating (kwh/yr) 12485 8440 7854 8499 5363 17086 13393 14214 9671 22244	Waterloo, Cooling (kwh/yr) 967 762 762 733 381 1865 1026 1055 557	lowa Water Heating (kwh/yr) 4396 4015 4015 938 5803 5480 5480 1436 5891	Lights and Appliances (kwh/yr) 6759 5663 5663 4073 7975 6927 6927 5057	Total (kwh/yr) 24607 18880 18294 18910 10755 32329 26826 27676 16721	Monthly Average (kwh/yr) 2051 1573 1525 1576 896 2694 2236 2306 1393	\$4.0% % Energy Savings Over Baseline 23.3% 25.7% 23.2% 56.3% 17.0% 14.4%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 1169 67
Option 3A Option 3B Energy Mod Climate Zor Model Baseline 1 Option 1 Option 1A Option 1B Baseline 2 Option 2 Option 2 Option 2A Option 2B Baseline 3	67 49 deling Informe 6 HERS 93 77 75 76 50 83 67 69 55	7503 hation Heating (kwh/yr) 12485 8440 7854 8499 5363 17086 13393 14214 9671 22244 19782	Waterloo, Cooling (kwh/yr) 967 762 762 733 381 1465 1026 1055 557	1319 Nowa Water Heating (kwh/yr) 4396 4015 4015 4015 5803 5480 5480 1436 5891 5568	Lights and Appliances (kwh/yr) 6759 5663 5663 4073 7975 6927 6927 9320	Total (kwh/yr) 24607 18880 18294 18910 10755 32329 26826 27676 16721 38598	Monthly Average (kwh/yr) 2051 1573 1525 1576 896 2694 2236 2306 1393 3217	\$4.0% % Energy Savings Over Baseline 23.3% 25.7% 23.2% 56.3% 17.0% 14.4% 48.3%	kwh/yr kwh/mo -avg area - sf	8420 702 404	7kw 9823 819 471	11226 936 538	12629 1052 605	1403 1166 673 3

c. Storm Water Management

- i. Utilize rain gardens, rain barrels, and pervious paving driveway / patios to manage a 1.25" rain event at minimum on site
- ii. Consider what is required to manage a 2.5" rain event on site.

d. Irrigation

- i. Static service pressure must not exceed 60psi
- ii. Consider no potable water irrigation system for the entire property as a first step
- iii. If irrigation is provided utilize a smart / efficient irrigation system for a maximum 50% of the site (assumed native landscaping utilized with rain barrels for additional irrigation)

4. WATER CONSERVATION

a. Fixtures:

- i. Utilize water conserving fixtures as outlined in the Criteria.
- ii. Consider Water Sense Certified Fixtures

5. OPERATING EFFICIENCY

- a. Green Streets 5.1a New Single-Family Construction
 - i. Utilize at minimum the Energy Performance Criteria and Air Barrier Insulation Checklist included in this section.
 - ii. Secure the services of a HERS Rater
 - 1. Collaborate regarding plan review, energy modeling, and inspection / testing to be completed prior to occupancy
 - iii. Size all HVAC Heating and Cooling Systems utilizing ACCA Manuals J, S, and D.
 - iv. Utilize advanced framing techniques as allowed by local building codes.

b. Moving to Zero Energy – Design and planning strategies

- i. Design home with HERS Rater modeling to achieve 5 points lower than HERS Goal of 56. Achieve HERS 51 or less.
- ii. Consider Certification of the design and construction with DOE ZERH Program
- iii. Consider orientation of plan and organize pathways for Photovoltaic / Solar Hot Water Ready systems
- iv. Consider install of PV and / or Solar Hot Water Systems
- v. The design is predicated on all-electric systems. If the home is built with gas heat and appliances, allow for electrical capacity and space for future switch from natural gas to all electric systems and appliances.

c. Appliances

- i. Install all Energy Star appliances kitchen, laundry, etc.
- d. Lighting i. Install latest LED permanent fixtures – indoor and outdoor fixtures
- e. Provide for electrical vehicle charging in garage.

6. MATERIALS

- a. Utilize materials that include post-consumer recycled content
- b. Utilize materials that do not off-gas and have low VOC content.
- c. Utilize materials that do not provide chemical hazards
- d. Utilize materials that are durable, low-maintenance, and cleanable

Energy Performance Criteria

Life igy remorniance cri	Cila		
as of April 2021			
	Iowa Green Streets		
	Criteria Post 11/2020	DOE ZERH	Energy Star 3.1
HERS Index	Less than or equal 56	by calculation	by calculation
Cooling			
Electric Forced-air, central air			
conditioners	16 SEER	13 SEER	13 SEER
Electric Forced-air, air-source			
heat pump	16 SEER	13 SEER	15 SEER
Electric Ground-source heat			
pump	18 EER		
Mini-Split Heat Pump	15 SEER / HSPF 8.5		
Heating			
Natural Gas Forced Air Furn	96 AFUE	94 AFUE	95 AFUE - Energy Star
Electric Forced-air, air-source			
heat pump	9 HSPF	10 HSPF	9.25 HSPF
Electric Ground-source heat			
pump	4 COP		
Whole House Ventilation		1.2 cfm/W heat exchange	
ASHRAE 62.2	Balanced System	with 60% SRE	
Water Heating			
	.95EF and Energy Star		
Electric	Qualified	2.0 EF	0.59 EF
	2.0 EF or greater and		
Electric Heat Pump	Energy Star qualified	2.0 EF	
Insulation Values			
Climate Zone 5			
Fenestration U-Factor / SHGC	0.30 / Any	0.27 / Any	
Doors	R-5 opaque		R 3.33 greater than 1/2 glass
Ceiling R-Value	R-49	R-49	R-49
Wood Framed Wall R-Value	R-13 Cavity + R-5 Cont.	R-13 Cavity + R-5 Cont.	R-13 Cavity + R-5 Cont.
		or R-20	or R-20
Basement Wall R-Value	R-15 / R-19 per code	R-15 / R-19 per code	R-15 / R-19 per code
Slab R-Value	R-10 @ 2' depth	R-10 @ 2' depth	R-10 @ 2' depth
Crawl Space	R-15 / R-19 per code	R-15 / R-19 per code	R-15 / R-19 per code
Climate Zone 6			
Fenestration U-Factor / SHGC	0.30 / Any	0.27 / Any	
Doors	R-5 opaque		R 3.33 greater than 1/2 glass
Ceiling R-Value	R-49	R-49	R-49
Wood Framed Wall R-Value	R-13 Cavity + R-5 Cont.	R-13 Cavity + R-5 Cont.	R-13 Cavity + R-5 Cont.
		or R-20 +5 or R-13 +10	or R-20 +5 or R-13 +10
Basement Wall R-Value	R-15 / R-19 per code	R-15 / R-19 per code	R-15 / R-19 per code
Slab R-Value	R-10 @ 2' depth	R-10 @ 2' depth	R-10 @ 2' depth
Crawl Space	R-15 / R-19 per code	R-15 / R-19 per code	R-15 / R-19 per code
Infiltration Rates	3.0 ACH50	2.0 ACH50	3.0 ACH50

- e. Utilize FSC certified wood products
- f. Utilize materials that foster local and regional economies
- g. Develop a construction waste management plan and recycle construction waste
- h. Provide for the material longevity by managing moisture / water so it drains and does not saturate materials
 - i. Manage roof water and slope grades away from foundations

7. HEALTHY LIVING ENVIRONMENT

- a. Implement a passive radon mitigation system.
- b. Utilize all electric systems and avoid combustion equipment and appliances
- c. Isolate the garage
- d. Seal all wall / floor joints and penetrations to prevent pest entry.
- e. No smoking on site during construction
- f. Install bathroom and kitchen exhausts and consider whole-house ventilation per ASHRAE 62.2
- g. Install supplemental dehumidification equipment to maintain less than 60% humidity
- h. Implement a construction indoor air quality management plan to prevent ductwork and systems / equipment from getting dirty during construction. OR earn the EPA Indoor Air Plus
- Provide for universal design
 - i. Incorporate sloped sidewalks and zero entries from sidewalk and garage for accessibility
 - ii. Create appropriate clearance space
 - 1. At minimum follow requirements of Chapter 11 IBC for Type A units as a
 - general guide for doors clearances, etc.

8. OPERATIONS, MAINTENANCE + OCCUPANT ENGAGEMENT

- a. Create a building operations and maintenance manual for the homeowner
- b. Provide a walk-through of systems and maintenance schedules with the homeowner.

ENERGY MODELING ANALYSIS:

Using the RESNET approved REMRate energy simulation software the variations of design were evaluated individually per their configuration. This process began with modeling the geometry of the dwelling and assigning thermal properties to each individual envelope component. From there the mechanical systems, lighting and appliances were assigned to further evaluate the energy consumption of the home. Final energy consumption and the home's corresponding HERS index reflect a year-round hourly simulation based on location. Using this simulation approach, the annual energy usage of the home is projected as designed. But as noted earlier, many variables can affect the final performance of the home once occupied; therefore, the final built home may achieve different results that what are projected below.

In the spreadsheet that follows tabulates various energy strategies organized by the following logic:

A. Option 1: Base Home:	1196 sf – 2 Bedroom, 1 Bathroom, Slab-on-Grade (003-004)
B. Option 2: 1 ½ Story Home:	1841 sf – 4 Bedroom, 2 Bathroom, Slab-on Grade (005-006)
C. Option 3: 1 ½ Story Home:	2943 sf – 5 Bedroom, 3 Bathroom, Slab-on Grade - With Basement

AIR BARRIER AND INSULATION INSPECTION COMPONENT GUIDE COMPONENT

COMPONENT	CRITERIA		
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air- permeable insulation is not used as a sealing material.		
Celling Air barrier in any dropped ceiling/soffit is substantially aligned vinsulation and any gaps are sealed.			
Walls	Corners and headers are insulated; junction of foundation and sill plate is sealed.		
Windows and doors	Space between window/door jambs and framing is sealed. No stuffing of fiberglass insulation is allowed.		
Rim joists are insulated and include an air barrier foll- reference to best practice example.			
Floors (including above-garage cantilevered floors)	Insulation is installed to maintain permanent contact with the area it is. Insulating Air barrier is installed at any exposed edge of insulation		
Crawl space walls	Insulation is permanently attached to walls. No poly or vinyl faced insulation. Follow included reference to best practice example. Exposed earth in unvented crawl spaces is covered with Class I vapor barrier with overlapping joints taped.		
Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned spaces are sealed.		
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled with sprayed/blown insulation. Narrow cavities are defined as 4 inches wide or less.		
Garage separation	Air sealing is provided between the garage and conditioned spaces and door assembly meets fire code.		
Recessed lighting	Recessed light fixtures are airtight, ICAT rated, & sealed to drywall. Exception—fixtures in conditioned space. Use LED flush mount lighting instead of recessed fixtures.		

COMPONENT	CRITERIA
Plumbing and wiring	Insulation is placed between the exterior wall and the pipes.
	Batt insulation is cut to fit around wiring and plumbing, or sprayed/ blown insulation extends behind piping and wiring
Shower/tub exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall
Electrical/phone box	Air barrier extends behind boxes or air-sealed-type boxes are installed on exterior walls
Common wall	Air barrier is installed in common wall between dwelling units and air infiltration is treated like an exterior wall. Common walls need to be considered as an exterior wall for air sealing.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Attic Doors & Hatches (from conditioned to unconditioned spaces)	Attic access (except unvented attic), knee-wall door, or drop-down stair is insulated and sealed or in conditioned space. Gasketed/barrier of a minimum of 18" tall/minimum of R-40 rigid foam on scuttle top. Must include fire rated assembly.
Fireplace	Fireplace walls include an air barrier. Wood-burning fireplaces shall have gasketed doors & outdoor combustion air/insulated/blocked & sealed.



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General notes

Cover sheet

Plan / Sections - 2 bedroom

slab-on-grade

Elevations - 2 bedroom

slab-on-grade

Plan / Sections - 4 bedroom occupied attic

Elevations - 4 bedroom

occupied attic Wall sections

Wall types and basement

Roof plan / site concept

Development orientation options

Performance criteria

Green Streets / energy Green Streets checklist

Green Streets checklist

Green Streets checklist

Schematic Design **Documents**

Iowa - High Performance Prototype Home

lowa Economic Development Authority

Iowa Energy Office

May 1, 2021

Project No: 20023.00

Green Streets



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2.8 Access to Transit (Mandatory for New Construction projects that do

not qualify as Rural/Tribal/Small Town; Optional for all other project types)

Locate projects within a 0.5-mile walk distance of transit services (bus, rail

and/or ferry), constituting at least 45 or more transit rides per weekday,

Locate the project along dedicated bike trails or lanes (Class I, II, or IV)

that lead to high-quality transit services (100 trips per day) within 3 miles.

Locate projects within a 0.5-mile walk distance of public transit services (bus, rail and/or ferry), constituting at least 45 or more transit rides per weekday, with some type of weekend service. [6 points] Locate the

project along dedicated bike trails or lanes (Class I, II, or IV) that lead to high-quality transit services (100 trips per day) within 3 miles. [2 points]

Optional: New Construction and Rehabilitation, Rural/Tribal/Small

with at least 45 rides per weekday and some weekend service. OR, Install at least two charging stations for electric vehicles. OR, Locate the project with 5 miles of one of the following transit options: 1) vehicle share

Improve access to community amenities through at least one of the

Design and build with passive solar design, orientation, and shading that

Rehabilitate and adapt an existing structure. Design the project to adapt, renovate, or reuse at least 50% of the existing structure and envelope.

Provide residents and staff with access to fresh, local foods through one

Locate building(s) within a community that is certified in LEED for

Neighborhood Development, LEED for Cities and Communities, Living

options incentivizing biking mobility or improving access to transit.

Locate the project within 0.5 mile walk distance of public transit services

program; 2) dial-a-ride program; 3) employer vanpool; 4) park-and-ride; 5)

Mandatory: New Construction, not Rural/Tribal/Small Town

Optional: New Construction, not Rural/Tribal/Small Town

with some type of weekend service.

public/private regional transportation.

meet the guidelines specified.

of the following options:

Option 1: Neighborhood Farms and Gardens

Option 2: Community-Supported Agriculture Option 3: Proximity to Farmers Market

OYES ONO OMAYBE 8 2.13 Advanced Certification: Site Planning, Design, and Management

Community Challenge, or SITES.

OYES ONO OMAYBE 2-8 2.9 Improving Connectivity to the Community

OYES ONO OMAYBE 5 max 2.10 Passive Solar Heating/Cooling

OYES ONO OMAYBE 10 2.11 Adaptive Reuse of Buildings

OYES ONO OMAYBE 6 2.12 Access to Fresh, Local Foods

2, 6, 8 Optional: Rehabilitation, not Rural/Tribal/Small Town

[2 points]





2.2 Connections to Existing Development and Infrastructure

2.3 Compact Development (Mandatory for New Construction)

planned bike paths to existing bike paths.

multifamily buildings greater than two-stories.

Locate the project on a site with access to existing roads, water, sewers, and other infrastructure and within or contiguous to (having at least

project to the existing pedestrian network. For sites over 5 acres, provide connections to the adjacent street network at least every 800 feet. Tie all

At a minimum, build to the residential density (dwelling units/acre) of the census block group where the project is located. In Rural/Tribal/Small Town locations that do not have zoning requirements: Build to a minimum net density of 5 units per acre for single-family houses; 10 units per acre for multifamily buildings, single and two-story; and 15 units per acre for

Exceed the residential density (dwelling units/acre) of the census block group in which your project is located. Exceed by 2x for [5 points]; exceed

by 3x for [7 points]. In Rural/Tribal/Small Towns that do not have zoning requirements, build to a minimum net density of 7.5 units per acre for single-family houses; 12 units per acre for multifamily buildings, single and two-story; and 20 units per acre for multifamily buildings greater than two

2.5 Proximity to Services and Community Resources (Mandatory for

Locate the project within a 0.5-mile walk distance of at least four, or a

2.6 Preservation of and Access to Open Space for Rural/Tribal/Small

Option 2: Set aside a minimum of 10% (minimum of 0.25 acres) of the total project acreage as open and accessible to all residents; at least 80%

Option 2: Set aside a percentage of permanent open space for use by all residents; at least 80% of which unpaved. 20% [2 points]; 35% [4 points];

45% + written statement of preservation/conservation policy [6 points].

1-mile walk distance of at least seven, of the listed services.

(Mandatory for New Construction Rural/Tribal/Small Town)

Option 1: Locate the project within a 0.25-mile walk distance of dedicated public open space that is a minimum of 0.75 acres; at least

Option 1: Locate the project within a 0.25-mile walk distance of dedicated open space that is a minimum of 0.75 acres; at least 80% of

25% of the perimeter bordering) existing development. Connect the

M = MANDATORY

OYES ONO OMAYBE 5 or 7 2.4 Compact Development

stories. [5 points]

80% of which unpaved.

of which unpaved. OYES ONO OMAYBE 6 max 2.7 Preservation of and Access to Open Space

which unpaved.

OYES ONO OMAYBE 10 3.5 Surface Stormwater Management: Channel Protection Volume

3.6 Efficient Irrigation and Water Reuse (Mandatory, if permanent irrigation is utilized)

3.7 Efficient Irrigation and Water Reuse

(for systems grandfathered-in in 3.6)

SUBTOTAL OPTIONAL POINTS

4. WATER CONSERVATION

4.1 Water-Conserving Fixtures

requirements listed.

= OPTIONAL POINTS

OYES ONO OMAYBE M

OYES ONO OMAYBE M

OYES ONO OMAYBE M

OYES ONO OMAYBE M

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M = MANDATORY # = OPTIONAL POINTS

OYES ONO OMAYBE M

OYES ONO OMAYBE 6

M = MANDATORY

= OPTIONAL POINTS

OYES ONO OMAYBE M

OYES ONO OMAYBE

2020 IOWA GREEN STREETS CRITERIA QUICK REFERENCE

This checklist provides an overview of the technical requirements within the lowa Green Street Criteria.

To achieve Iowa Green Streets Criteria Certification, all projects must achieve compliance with the Criteria mandatory measures applicable to that project type. Additionally, New Construction projects must achieve 40 optional points, Substantial Rehab projects must achieve 35 optional points, and Moderate Rehab projects must also achieve 35 optional points.

Projects proposing to achieve a higher quantity of optional points may be scored more favorably during the application review process. To assist you in evaluating your project, a fillable form is available here: lowaeda. com/userdocs/programs/2020iowagreenstreetscriteriachecklistform.pdf

M = MANDATORY # = OPTIONAL POINTS		
		1. INTEGRATIVE DESIGN
OYES ONO OMAYBE	М	1.1 Integrative Design: Project Priorities Survey Complete the Project Priorities Survey in Appendix K.
OYES ONO OMAYBE	М	1.2 Integrative Design: Charrettes and Coordination Meetings Develop an integrative design process that moves the outputs of the Project Priorities Survey into action through a series of collaborative meetings. Prioritize multi-benefit strategies. Assign responsibility within your design and development teams for accountability.
OYES ONO OMAYBE	M	1.3 Integrative Design: Documentation Include Iowa Green Streets Criteria information in your contract documents and construction specifications (Division 1 Section 01 81 13 Sustainable Design Requirements) as necessary for the construction team to understand the requirements and how they will be verified. Ensure, and indicate that the drawings and specifications have been generated to be compliant and meet the certification goals.
OYES ONO OMAYBE	M	1.4 Integrative Design: Construction Management Create, implement, and document your contractor/subcontractor education plan to ensure that all persons working on-site fully understand their role in achieving the project objectives. Include a summary of the Project Priorities Survey (Criterion 1.1), the sustainability goals, and anticipated roles of each party regarding performance expected of the project. Attach and reference this training plan to Division 1 Section 01 81 13 Sustainable Design Requirements. Include timeline estimates for performance testing and verification schedules in the overall construction schedule. As relevant, review requirements for Criteria 8.1, 8.2, and 8.3, and begin populating these documents with relevant information from design and construction.
OYES ONO OMAYBE	12 or 15	1.5 Design for Health and Well-Being: Health Action Plan Follow Steps 1–6 of the Health Action Plan framework per the full criterion. [12 points with extra 3 points for Step 7] This includes: 1) Commit to embedding health into the project lifecycle; 2) Partner with a project health professional; 3) Collect and analyze community health data; 4) Engage with community stakeholders to prioritize health data and strategies; 5) Identify strategies to address those health issues; 6) Create an implementation plan; and 7) Create a monitoring plan.

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M = MANDATORY

= OPTIONAL POINTS

OYES ONO OMAYBE

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M = MANDATORY

OYES ONO OMAYBE M

OYES ONO OMAYBE M

M = MANDATORY

= OPTIONAL POINTS

If your site contains any of these ecologically sensitive features, follow the



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2020 IOWA	GREEN	SIREEIS	CRITERIA	CHECKLIST

(Mandatory to manage 2.5" rain event for lowa Green Streets Certification

Through on-site infiltration, evapotranspiration, and rainwater harvesting,

(new construction or projects disturbing ≥ 1,000 square feet.

retain the 1,25" rain event on site (rehab projects) or 2,5" rain event on site

At least 50% of the site's irrigation satisfied by water use from the sources

At least 50% of the site's irrigation satisfied by water use from the sources

Install water-conserving fixtures meeting the specifications in the criterion. For all single-family homes and all dwelling units in buildings three stories

Reduce total indoor water consumption by at least 30% compared to

baseline indoor water consumption chart. Any new toilet, showerhead,

built before 1986; Optional for all other building types: Replace lead

Mandatory: For multifamily buildings with either a cooling tower, a

centralized hot water system, or 10+ stories: Develop a Legionella water

or fewer, the static service pressure must not exceed 60 psi.

M / 3 Mandatory/Optional: Mandatory for Substantial Rehabs of buildings

[Mandatory for Iowa Green Streets Certification Plus]

and/or lavatory faucet must be WaterSense certified.

listed. If irrigation is utilized, install an efficient irrigation system per the

14 Local Economic Development and Community Wealth Creati emonstrate that local preference for construction employment and ubcontractor hiring was part of your bidding process, and how it inctioned during construction. R emonstrate that you achieved at least 20% local employment.
R rovide physical space for small business, nonprofits, and/or skills and orkforce education.
15a Access to Broadband: Broadband Ready Mandatory for New Construction and Substantial Rehab Projects in ural/Tribal/Small Town Locations) corporate broadband infrastructure so that when broadband service bromes to a community, the property can be easily connected. Include etwork of mini-ducts or conduit throughout the building, extending from the expected communications access point to each network termination in the building.
15b Access to Broadband: Connectivity Optional for Rural/Tribal/Small Town) Insure all units and common spaces in the property have broadband ternet access with at least a speed of 25/3 mbs.
UBTOTAL OPTIONAL POINTS
SITE IMPROVEMENTS
.1 Environmental Remediation etermine whether there are any hazardous materials present on the s prough one of the four methods listed. Mitigate any contaminants four
.2 Minimization of Disturbance During Staging and Construction or sites >1 acre, implement EPA's National Pollutant Discharge imination System Stormwater Discharges from Construction Activitie uidance, or local requirements, whichever is more stringent. For sites ith an area ≤1, follow guidance in full criterion.
3 Ecosystem Services/Landscape Mandatory, if providing landscaping) providing plantings, all must be native or climate-appropriate (adapte the region and appropriate to the site's soil and microclimate. Do ot introduce any invasive plant species. Plant, seed, or xeriscape all sturbed areas.

(Mandatory for New Construction; Mandatory for all Rehab projects if land

Through on-site infiltration, evapotranspiration, and rainwater harvesting,

management program. Optional: Test and remediate as indicated for lead, nitrates, arsenic, and coliform bacteria.

OYES ONO OMAYBE 6 max 4.2 Advanced Water Conservation

4.3 Water Quality

service lines. [3 points]

II - OI HOIVIL	1 011410	
OYES ONO OMAYBE	10	1.6 Resilient Communities: Multi-Hazard/Vulnerability Assessment Conduct a four-part assessment (social, physical, functional, strategy) to identify critical risk factors of your property and implement at least two sets of strategies to enable the project to adapt to, and mitigate, climate related or seismic risks. See full criterion for more guidance.
OYES ONO OMAYBE	8	1.7 Resilient Communities: Strengthening Cultural Resilience Integrate community and resident participation in the development processes so that the built environment honors cultural identities, resident voices, and community histories. Option 1: Complete a Cultural Resilience Assessment OR Option 2: Convene a Cultural Advisory Group
OYES ONO OMAYBE	M	Resilient Structures Mandatory: New residential construction projects without a basement construct a safe room to protect against wind forces and wind debris from events such as a tornado.
	10	Optional: New construction projects with a basement and rehab projects construct a safe room to protect against wind forces and wind debris from events such as a tornado.
		SUBTOTAL OPTIONAL POINTS
M = MANE # = OPTIONAL	444 100 000 000	
		2. LOCATION + NEIGHBORHOOD FABRIC
OYES ONO OMAYBE	M	2.1 Sensitive Site Protection All projects must: 1. Protect floodplain functions (e.g., storage, habitat, water quality) by limiting new development within the 100-year floodplain of all types of watercourses.
		Conserve and protect aquatic ecosystems, including wetlands and deepwater habitats, that provide critical ecosystem functions for fish, other wildlife, and people.
		 Protect ecosystem function by avoiding the development of areas that contain habitat for plant and animal species identified as threatened or endangered.
		 Conserve the most productive agricultural soils by protecting prime farmland, unique farmland, and farmland of statewide or local importance.

specific Requirements under that subheading.

2020 IOWA GREEN STREETS CRITERIA CHECKLIST

# = OPTIONAL I	POINTS	
OYES ONO OMAYBE	3	2.14 Local Economic Development and Community Wealth Creation Demonstrate that local preference for construction employment and subcontractor hiring was part of your bidding process, and how it functioned during construction. OR Demonstrate that you achieved at least 20% local employment. OR Provide physical space for small business, nonprofits, and/or skills and workforce education.
OYES ONO OMAYBE	M	2.15a Access to Broadband: Broadband Ready (Mandatory for New Construction and Substantial Rehab Projects in Rural/Tribal/Small Town Locations) Incorporate broadband infrastructure so that when broadband service comes to a community, the property can be easily connected. Include a network of mini-ducts or conduit throughout the building, extending from the expected communications access point to each network termination point in the building.
OYES ONO OMAYBE	6	2.15b Access to Broadband: Connectivity (Optional for Rural/Tribal/Small Town) Ensure all units and common spaces in the property have broadband internet access with at least a speed of 25/3 mbs.
		SUBTOTAL OPTIONAL POINTS
M = MAND # = OPTIONAL I	Control of the contro	
		3. SITE IMPROVEMENTS
OYES ONO OMAYBE	M	3.1 Environmental Remediation Determine whether there are any hazardous materials present on the site through one of the four methods listed. Mitigate any contaminants found.
OYES ONO OMAYBE	M	3.2 Minimization of Disturbance During Staging and Construction For sites >1 acre, implement EPA's National Pollutant Discharge Elimination System Stormwater Discharges from Construction Activities guidance, or local requirements, whichever is more stringent. For sites with an area ≤1, follow guidance in full criterion.

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002	General notes
003	Plan / Sections - 2 bedroor
	slab-on-grade
004	Elevations - 2 bedroom
	slab-on-grade
005	Plan / Sections - 4 bedroor
	occupied attic

Elevations - 4 bedroom occupied attic Wall sections

Wall types and basement Roof plan / site concep

Development orientation

Performance criteria

Green Streets / energy Green Streets checklis

Schematic Design **Documents**

Iowa - High Performance Prototype Home

Iowa Energy Office

lowa Economic Development Authority

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Green Streets Checklist

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3.4 Surface Stormwater Management

retain the 1.25" rain event on site.

disturbed is ≥1,000 sq.ft.)





5.4 Achieving Zero Energy [5.2b or 5.4 Mandatory for lowa Green

a given year than the project is modeled to consume.

Streets Certification Plus (Not available for projects following Criterion

5.2a, 5.2b, 5.3a, or 5.3b.) Achieve Zero Energy performance through one

Option 1; Certify each building in the project to DOE Zero Energy Ready

Home program or PHI Plus AND Either install renewables and/or procure

Option 2: Certify each building in the project in a program that requires zero energy performance such as PHIUS_ Source Zero, PHI Plus, PHI

Premium, ILFI's Zero Energy Petal, Zero Carbon Petal, or Living Building

[Mandatory for Disaster Recovery Housing Projects] (Not available for

Ensure the project has adequate electric service and has been designed

and wired to allow for a seamless switch to electricity as a fuel source in

the future for the following uses: space heating [1 point], space cooling [1

point], water heating (DHW) [1 point], clothes dryers [1 point], equipment

seeking Iowa Green Streets Certification Plus may request additional

funding with proof of additional costs] (Not available for projects following

No combustion equipment used as part of the building project; project is

Substantial and Moderate Rehabs that include replacement of heating

Size and select heating and cooling equipment in accordance with ACCA

manuals J, S, and D OR in accordance with the ASHRAE Handbook of

Install ENERGY STAR clothes washers, dishwashers, and refrigerators. If

time of installation or replacement, ENERGY STAR models must be used

5.8 Lighting (Mandatory for all lighting within New Construction and Substantial Rehab projects. Mandatory for new lighting in Moderate

Follow the guidance for high-efficacy permanently installed lighting and

(Not relevant for Rehab projects in Special Flood Hazard Areas)

other characteristics for recessed light fixtures, lighting controls, lighting

Conduct floodproofing of lower floors, including perimeter floodproofing

(barriers/shields). Design and install building systems as specified by the

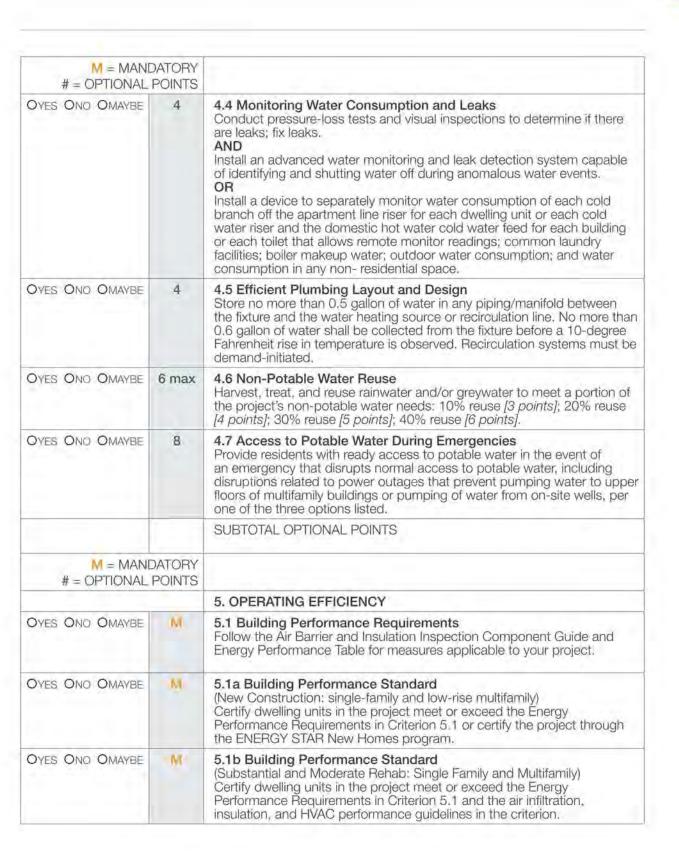
full criterion so that operation of those systems will not be grossly affected

appliances will not be installed or replaced at this time, specify that at the

5.7 ENERGY STAR Appliances (Mandatory if providing appliances.)

5.6 Sizing of Heating and Cooling Equipment (Mandatory for

renewable energy, which in sum will produce as much, or more, energy in



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M = MANDATORY

OYES ONO OMAYBE 8 5.10 Resilient Energy Systems: Critical Loads

Option 1 [5 points]

Option 2 [10 points]

Conservation Code.

6. MATERIALS

OYES ONO OMAYBE 8 max 6.1 Ingredient Transparency for Material Health

SUBTOTAL OPTIONAL POINTS

screened to 1,000 ppm or better:

categories: adhesives, sealants, windows.

different product categories.

verified Declare label.

OYES ONO OMAYBE 3 max 6.2 Recycled Content and Ingredient Transparency

recycled content.

OYES ONO OMAYBE 8 max | 6.3 Chemical Hazard Optimization

OYES ONO OMAYBE 5-10 5.11 Electric Vehicle Charging

described by the full criterion.

Option 2: Efficient generator

Option 1: Islandable PV system

= OPTIONAL POINTS

OYES ONG OMAYBE

M = MANDATORY

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= OPTIONAL POINTS

		adopted Energy Code at the time of submittal for plan review by at least 10 percent. Commission the building.
OYES ONO OMAYBE	М	5.1d Building Performance Standard (Substantial and Moderate Rehab: Commercial, Nonprofit and Mixed-Use) Follow all applicable requirements and best practices in Criterion 5.1. Substantial rehab projects must exceed the performance of the current state of lowa adopted Energy Code at the time of submittal for plan review by at least 10 percent. Moderate rehab projects must meet or exceed the current state of lowa adopted Energy Code at the time of submittal for plan review. Commission the building.
OYES ONO OMAYBE	12 max	5.2a Moving to Zero Energy: Additional Reductions in Energy Use [Mandatory for Disaster Recovery Housing Projects to Achieve ≥5 points] (Not available for projects using prescriptive path for Criterion 5.1a or for projects following Criterion 5.2b or 5.4.) Design and construct a building that is projected to be more efficient than what is required by Criteria 5.1a-5.1d. Achieve HERS score of 5 points lower than required by 5.1a-5.1d OR 5% greater efficiency than required it following ASHRAE path for 5.1a-5.1d compliance [5 points]. Additional 1 point for each additional 2-point decrease in HERS score required by Criteria 5.1a-5.1d OR for 1% greater efficiency if following ASHRAE path for Criteria 5.1a-5.1d, up to a maximum of 12 optional points.
OYES ONO OMAYBE	12-15	5.2b Moving to Zero Energy: Near Zero Certification [5.2b or 5.4 Mandatory for Iowa Green Streets Certification Plus] (Not available for projects following Criterion 5.2a or 5.4.) Certify the project in a program that requires advanced levels of building envelope performance such as DOE ZERH [12 points] and/or PHI Classic or PHIUS+ [15 points].
OYES ONO OMAYBE	3-6	5.3a Moving to Zero Energy: Photovoltaic/Solar Hot Water Ready [Mandatory for Disaster Recovery Housing Projects] (Not available for projects following Criterion 5.3b or 5.4.) Orient, design, engineer, wire, and/or plumb the development through the Photovoltaic Ready pathway or Solar Hot Water Ready Pathway to accommodate installation of photovoltaic (PV) or solar hot water system in the future.
OYES ONO OMAYBE	8 max	5.3b Moving to Zero Energy: Renewable Energy (Not available for projects following Criterion 5.3a or 5.4) Install renewable energy source to provide a specified percentage of the project's estimated source energy demand. See full criterion for allowable sources. Option 1: For percentage of total project energy consumption provided by renewable energy.

provided by renewable energy.

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(New Construction: Commercial, Nonprofit and Mixed-Use)

Follow all applicable requirements and best practices in Criterion 5.1.

Projects must exceed the performance of the current state of lowa

M = MANDATORY

OVES ONO OMAYBE M 5.1c Building Performance Standard

= OPTIONAL POINTS

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M = MANDATORY

= OPTIONAL POINT

OYES ONO OMAYBE M

OYES ONO OMAYBE M

OYES ONO OMAYBE M

OYES ONG OMAYBE M

OYES ONO OMAYBE M

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OYES ONO OMAYBE

M = MANDATORY

of the following:

OYES ONO OMAYBE | 5 max | 5.5a Moving to Zero Carbon: All-Electric Ready

for cooking [1 point].

and cooling equipment.)

via Criterion 8.1 and Criterion 8.4.

power density, and exterior lighting.

7. HEALTHY LIVING ENVIRONMENT

(Mandatory for New Construction and Substantial Rehab)

7.2 Reduce Lead Hazards in Pre-1978 Buildings

For New Construction in EPA Zone 1 areas, install passive radon-resistant features below the slab and a vertical vent pipe with junction box within

10 feet of an electrical outlet in case an active system should prove

necessary in the future. For Substantial Rehab projects in EPA Zone 1,

test before and after the retrofit and mitigate per the specified protocols.

(Mandatory for Substantial Rehab of Buildings Constructed Before 1978)

Control identified lead hazards using lead abatement or interim controls,

For New Construction and Rehab projects: Specify power-vented or

direct-vent equipment when installing any new combustion appliance for space or water heating that will be located within the conditioned space. If

there are any combustion appliances within the conditioned space, install one hard-wired carbon monoxide (CO) alarm with battery backup function

for each sleeping zone, placed per National Fire Protection Association

For Rehabs: If there is any combustion equipment located within the conditioned space for space or water heating that is not power-vented or direct-vent and that is not scheduled for replacement, conduct

combustion safety testing prior to and after the retrofit; remediate as

Provide a continuous air barrier between the conditioned space and

any garage space to prevent the migration of any contaminants into

the living space. Visually inspect common walls and cellings between

Do not install ductwork or air handling equipment for the conditioned

Fix all connecting doors between conditioned space and garage with

Install one hard-wired CO alarm with battery backup function for each

sleeping zone of the project, placed per NFPA 72 unless the garage is

Seal all wall, floor, and joint penetrations with low-VOC caulking or other

area and within a 25-foot perimeter around the exterior of all residential

provide a graduated enforcement policy. Make the smoke-free policy

buildings. Lease language must prohibit smoking in these locations and

datory: Implement and enforce a smoke-free policy in all common

mechanically ventilated or an open parking structure.

7.6 Smoke-Free Policy (Mandatory and Optional)

appropriate nontoxic sealing methods to prevent pest entry.

attached garages and living spaces to ensure that they are air-sealed

Conduct lead risk assessment or inspection to identify lead hazards.

using lead-safe work practices that minimize and contain dust.

7.1 Radon Mitigation

7.3 Combustion Equipment

(NFPA) 72.

indicated.

7.4 Garage Isolation

space in a garage.

before insulation is installed.

gaskets or make airtight.

7.5 Integrated Pest Management

5.9 Resilient Energy Systems: Floodproofing

Criterion 5.5a)

Fundamentals.

Rehab projects.)

in a flood.

all-electric.

projects following Criterion 5.5b)

OYES ONO OMAYBE 15 5.5b Moving to Zero Carbon: All Electric [Disaster Recovery Projects

= OPTIONAL POINTS

OYES ONO OMAYBE 24

OYES ONO OMAYBE M

OYES ONO OMAYBE M

OYES ONG OMAYBE M

OYES ONO OMAYBE 8

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Provide emergency power to serve at least three critical energy loads as

[Disaster Recovery Projects seeking lowa Green Streets Certification Plus

Following the 2021 International Energy Conservation Code install an

electric vehicle charging capable panel with the capacity and space to

support the necessary amperage and volts for future charging station

Install an active charging station(s) to meet or exceed the minimum

5.12 Advanced Framing and Resilient Design

number of electric vehicle ready spaces in the 2021 International Energy

Use advanced framing (optimum value engineering) best practices for all

Install products that have publicly disclosed inventories characterized and

1 point per 5 installed Declare or HPD products from at least three

1 point per each product with third-party verified HPD or third party

2 points per each product with third-party verified HPD or third party

verified Declare label in any of these categories: adhesives, sealants,

Use building products that feature, and disclose, their recycled content. The building product must make up 75% by weight or cost of a project

Install products that have third-party verification of optimization to 100

ppm or better per the options listed within the full criterion.

category for the project and be composed of at least 25% post-consumer

1 point per 2 installed Declare or HPD products in any of these

may request additional funding with proof of additional costs].

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1-5 Option 2: For percentage of common area meter energy consumption

	M = MANE # = OPTIONAL
M 15 max	OYES ONO OMAYBE
12 max	OYES ONO OMAYBE
M	OYES ONO OMAYBE
4 max	OYES ONO OMAYBE
М	OYES ONO OMAYBE
M	OYES ONO OMAYBE
M 6 max	OYES ONO OMAYBE
12 max	OYES ONO OMAYBE

2020 IOWA GREEN STREETS CRITERIA MANUAL

M = MANI # = OPTIONAL			
OYES ONO OMAYBE	M 15 max	6.4 Healthier Material Selection Select all interior paints, coatings, primers, and wallpaper; interior adhesives and sealants; flooring; insulation; and composite wood as specified. Optional points also available.	
OYES ONO OMAYBE	12 max	6.5 Environmentally Responsible Material Selection Select concrete, steel, or insulation with a publicly disclosed EPD [3 points], Install a green or cool roof [3 points], use reflective paving [3 points], and/or use FSC certified wood [3 points]. Refer to criterion for specifics.	
OYES ONO OMAYBE	M	6.6 Bath, Kitchen, Laundry Surfaces (Mandatory for New Construction and Substantial Rehab. Moderate Rehabs that do not include work in the shower and tub areas are exempt from the shower and tub enclosure requirement.) Use materials that have durable, cleanable surfaces throughout bathrooms, kitchens, and laundry rooms. Use moisture-resistant backing materials per ASTM # D 6329 or 3273 behind tub/shower enclosures, apart from one-piece fiberglass enclosures which are exempt.	
OYES ONO OMAYBE	4 max	6.7 Regional Materials [Mandatory for lowa Green Streets Certification Plus] Use products that were processed and manufactured regionally. Select or all of these options (every two compliant materials can qualify for 1 po Framing Cladding (e.g. siding, masonry, roofing) Flooring Concrete/cement and aggregate Drywall/interior sheathing	
OYES ONO OMAYBE	M	6.8 Managing Moisture: Foundations (Mandatory for all New Construction projects and for all Rehab projects replacing/modifying basement or crawl space) Install capillary breaks and vapor retarders that meet specified criteria appropriate for the foundation type.	
OYES ONO OMAYBE	M	6.9 Managing Moisture: Roofing and Wall Systems (Mandatory for Rehab projects that include deficiencies in or replacing assemblies call out below.) Provide water drainage away from walls, window, and roofs by implementing the list of techniques.	
OYES ONO OMAYBE	6 max	6.10 Construction Waste Management Develop and implement a waste management plan that reduces non-hazardous construction and demolition waste through recycling, salvaging, or diversion strategies through one of the three options. Achieve optional points by going above and beyond the requirement.	
OYES ONO OMAYBE	12 max	6.11 Recycling Storage For projects with municipal recycling infrastructure and/or haulers, provide separate bins for the collection of trash and recycling for each dwelling unit and all shared community rooms. OR For projects without that infrastructure, advocate to the local waste hauler or municipality for regular collection of recyclables.	

Optional: Expand the policy above to include all indoor spaces in the property.

readily available.



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Cover sheet General notes

> Plan / Sections - 2 bedroom slab-on-grade Elevations - 2 bedroom

Plan / Sections - 4 bedroom occupied attic

slab-on-grade

Elevations - 4 bedroom occupied attic

Wall sections Wall types and basement

Roof plan / site concept Development orientation

Performance criteria

Green Streets / energy

Green Streets checklis

Green Streets checklis

Green Streets checklis

Schematic Design **Documents**

Iowa - High Performance Prototype Home

lowa Energy Office

lowa Economic Development Authority

Project No: 20023.00

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Green Streets Checklist

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OYES ONO OMAYBE M 12 max		7.7 Ventilation (Mandatory for New Construction and Substantial Rehab; Optional for Moderate Rehab) For each dwelling unit in full accordance with the current version of ASHRAE 62.2 or 62.1 as coordinated with the adopted edition of the IEC C for the State of lowa, install: A local mechanical exhaust system in each bathroom [3 points if Moderate Rehab] A local mechanical exhaust system in each kitchen [3 points if Moderate Rehab] A whole-house mechanical ventilation system [3 points if Moderate Rehab] Verify these flow rates are either within +/- 15 CFM or +/- 15% of design value. Each multifamily building ≥ 4 stories, in accordance with the current version of ASHRAE 62.2 or 62.1 as coordinated with the adopted edition of the IEC C for the State of lowa, install: A mechanical ventilation system for all hallways and common spaces [3 points if Moderate Rehab] For all project types, in addition to the above requirements: All systems and ductwork installed per manufacturer's recommendations All bathroom fans ENERGY STAR-labeled and wired for adequate runtime. If using central ventilation systems with rooftop fans, each fan must be direct-drive and variable-speed with speed controller mounted near the fan. Fans with design CFM 300-2000 must also have an ECM motor.	
OYES ONO OMAYBE	М	7.8 Dehumidification Option 1: Design, select, and install supplemental dehumidification equipment to keep relative humidity <60%. OR Option 2: Equip all dwelling units with dedicated space, drain, and electrical hook-ups for permanent supplemental dehumidification systems to be installed if needed and install interior RH monitoring equipment as described.	
OYES ONO OMAYBE	3	7.9 Construction Pollution Management Option 1: Earn the EPA Indoor airPlus label OR Option 2: In all dwelling units, seal all heating, cooling, and ventilation return and supply floor ducts and returns throughout construction to prevent construction debris from entering. Flush all dwelling units after completion of construction and prior to occupancy for either 48 hours or with at least 14,000 ft3 per ft2 of floor area, then replace all air handling equipment filters.	
OYES ONO OMAYBE	3	7.10 Noise Reduction Option 1: Test and demonstrate that noise levels in bedrooms meet 30 dB LAeq (continuous) and 45 dB LAmax, (single sound). OR Option 2: Provide a noise abatement plan specific to the site covering general noise mitigation techniques in accordance with 24 CFR 51B. OR Option 3: Ensure all exterior wall and party wall penetrations are sealed with acoustical sealant, all party walls and floor/ceiling assemblies have an STC rating of at least 55, and exterior windows and doors in projects near a significant exterior noise source have an STC rating of at least 35.	

M = MAND # = OPTIONAL	1 11 -11	
Oyes Ono Omaybe	9	7.11 Active Design: Promoting Physical Activity Option 1: Encouraging Everyday Stair Usage (buildings that include stairs as the only means to travel from one floor to another are not eligible for this option.) Provide a staircase that is accessible and visible from the main lobby and is visible within a 25-foot walking distance from any point in the lobby per the specifications listed. Place point-of-decision signage. OR Option 2: Activity Spaces. Provide on-site dedicated recreation space with exercise or play opportunities for adults and/or children that is open and accessible to all residents; see criterion for specifics.
Oyes Ono Omaybe	М	7.12 Beyond ADA: Universal Design Mandatory (Residential Projects Only): Implement Division 1, Required Best Practices, of the Iowa Green Streets Criteria Universal Design Required and Bonus Best Practices Checklist.
	10	Optional [10 points]: Implement Division 2, Best Practices, of the lowa Green Streets Criteria Universal Design Required and Bonus Best Practices Checklist.
OYES ONO OMAYBE 8		7.13 Healing-Centered Design Select and implement at least two of the Options with at least two different strategies listed in at least 75% units. Option 1: Provide an environment that promotes feelings of real and perceived safety. Option 2: Create flexible spaces that allow for personalization and/or manipulation to meet individual and community needs. Option 3: Connect residents and staff to a living landscape and the natural environment. Option 4: Utilize art and culture in project design and programming and promote social connectedness.
		SUBTOTAL OPTIONAL POINTS
M = MAND # = OPTIONAL	7.3.0	8. OPERATIONS, MAINTENANCE + OCCUPANT ENGAGEMENT
OYES ONO OMAYBE	M	8.1 Building Operations & Maintenance Manual and Plan (For all Multifamily, Commercial and Mixed-Use projects) Develop a manual with thorough building operations and maintenance (0&M) guidance and a complementary plan. The manual and plan should be developed over the course of the project design, development, and construction stages, and should include sections/chapters addressing the list of topics.
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OYES ONG OMAYBE	M	8.2 Emergency Management Manual (For all Multifamily, Commercial and Mixed-Use projects)	
		Provide a manual on emergency operations targeted toward operations and maintenance staff and other building-level personnel. The manual should address responses to various types of emergencies, leading with those that have the greatest probability of negatively affecting the project. The manual should provide guidance as to how to sustain the delivery of adequate servicesg throughout an emergency and cover a range of topics, including but not limited to: • communication plans for staff and residents • useful contact information for public utility and other service providers • infrastructure and building "shutdown" procedures • plan for regular testing of backup energy systems, if backup systems exist	
OYES ONO OMAYBE	M	8.3 Occupant Manual Provide a guide for building tenants and residents that explains the int benefits, use and maintenance of their building's green features and practices. The Occupant Manual should encourage green and healthy activities per the list of topics.	
OYES ONO OMAYBE	M	8.4 Walk-Throughs and Orientations to Property Operation Provide a comprehensive walk-through and orientation for all residents, property manager(s), and buildings operations staff.	
OYES ONO OMAYBE	М	8.5 Energy and Water Data Collection and Monitoring For rental properties, upload project energy and water performance data in an online utility benchmarking platform annually for at least five years from time of construction completion per one of the four methods provided; grant IEDA view access for that period. For owner-occupied units, collect and monitor utility data in a manner that allows for easy access and review.	
		SUBTOTAL OPTIONAL POINTS	
		TOTAL OPTIONAL POINTS	

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