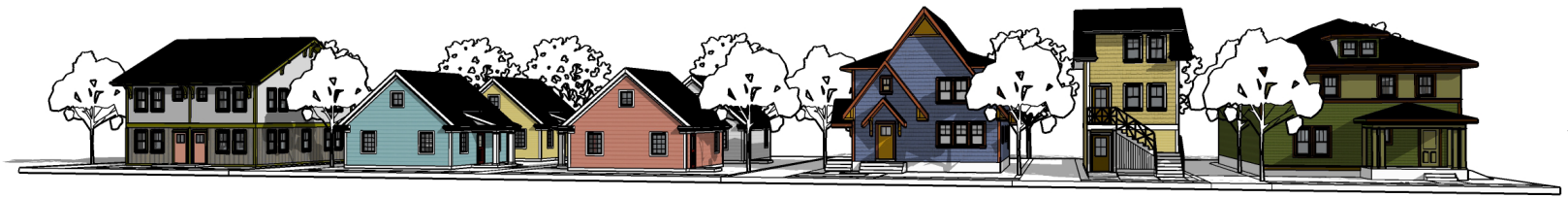
MICHIGAN PATTERN
BOOK HOMES MANUAL

THE GROVE RESIDENCE



Contents

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Hold Harmless Statement

This Pattern Book for new infill construction is focused on housing solutions based on built historic precedents, current housing trends, and primary documentary research. In presenting replicable, context-sensitive designs for use in creating new infill construction, our goal is to enrich the urban fabric of neighborhoods within existing downtown-adjacent Michigan neighborhoods.

In championing infill and the concentration of new housing units within existing infrastructure, our focus is upon vacant lots laid bare by blight removal or the utilization of lots never built upon. The building concepts, sample interior layouts, and open-source construction documents presented in this publication are intended for construction on vacant parcels in existing neighborhoods or redevelopment sites. In no way is this manual or the recommendations contained herein an endorsement for teardowns of existing historic housing units.

Visual and written recommendations are provided for housing form/massing, lot placement, and exterior finishes which are complementary to existing neighborhoods. The design team has paid close attention to International Building Code Standards and principles of Universal Design. Sample construction documents are presented without an official seal. Surveying, landscape architecture, structural engineering and site engineering are outside of the scope of this endeavor. Each building site and its accompanying circumstances are unique. Statewide public distribution necessitated cautionary omissions in the final set. These omissions must be addressed by design professionals familiar with the chosen site. Verification of local conditions, including lot irregularities, soil conditions, snow loads, and numerous other factors will need to be confirmed by professionals who will address the many regional variations. In conclusion, it is incumbent on the groups or individuals who proceed with one or more of the model plans presented in this publication to conduct their own due diligence.

To the Owner

Building a home is a complex and multi-faceted process that involves careful planning, precise engineering, and adherence to local building codes and regulations. As a homeowner, it's essential to understand the various stages of construction, from site preparation and foundation work to framing, electrical and plumbing installation, and final finishing touches. Collaborating with architects, contractors, and specialists ensures that your vision is translated into a functional, structurally sound, and energy-efficient home. With attention to detail and proper project management, you can navigate the challenges of the construction process to achieve a well-built, personalized living space.

The Grove is a four-unit two-bedroom residence that offers the most efficient and simple layout with a comfortable living area and modern finishes.
The house has two bedrooms and one bathroom and comes with in-unit laundry which allows for convenient family living while the front porch extends liveable space outdoors.

This allows for the smaller footprint floorplan for multi units which allows maximum flexibility to accommodate smaller lots throughout the city.

Owners can pick and choose the style of the building to their liking.

Steps for the owner:

1. Get a site survey

2. Get a site plan

3. Review with the municipality

4. Choose materials

5. Get pricing from contractors

6. Build

The Grove Residence

OVERALL DIMENSIONS

Width	32’ - 0”
Depth	60’ - 0”

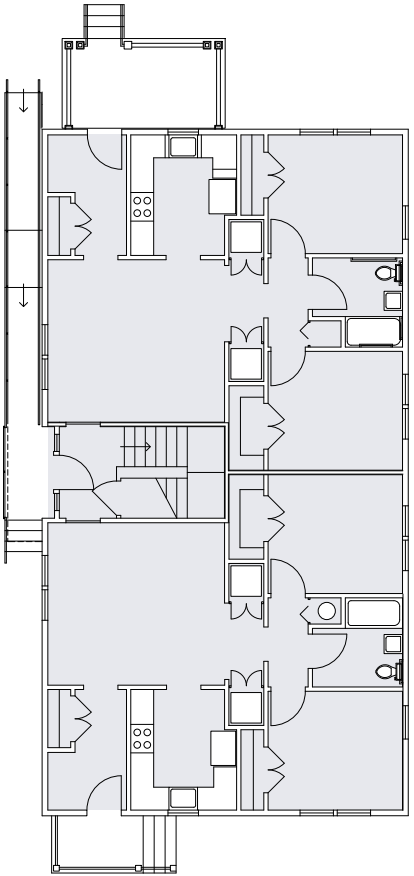
PROGRAM

Unit Configuration	2 BED / 1 BATH
Total Building	3658 SF
Main Level Unit	1829 SF
Upper Level Unit	1829 SF
Basement (Unfinished)	N/A

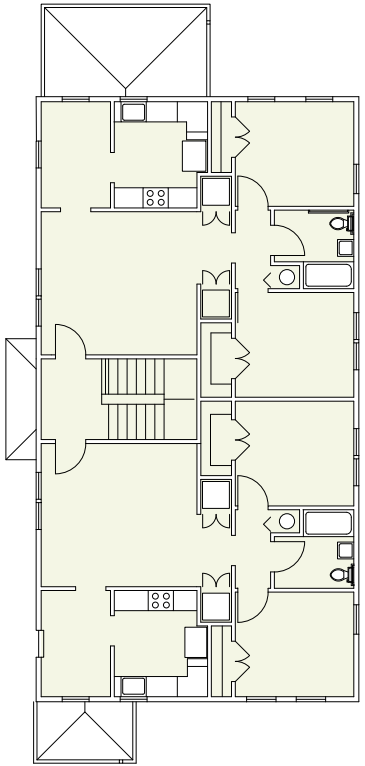
LOT SIZE STANDARD

Width (Minimum)	N/A
Depth (Minimum)	N/A

The two unit two bedroom duplex, one unit below and one unit above, offers the most efficient and simple layout with comfortable living area and modern finishes. Each apartment offers a two bedroom, one and a half bathroom with en suite laundry. The open space concept offers a modern living space arrangement.

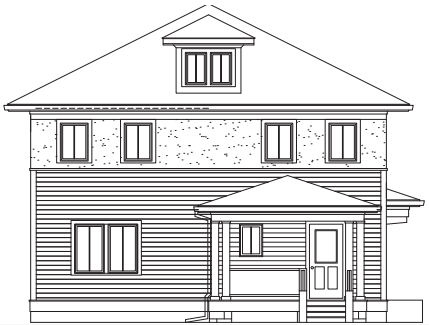


Ground Floor Plan

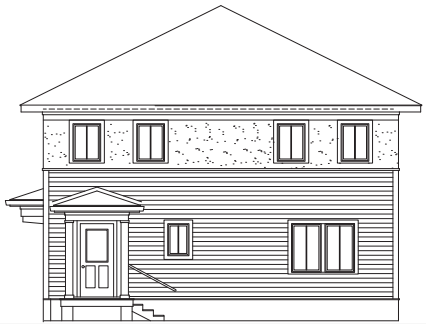


Second Floor Plan

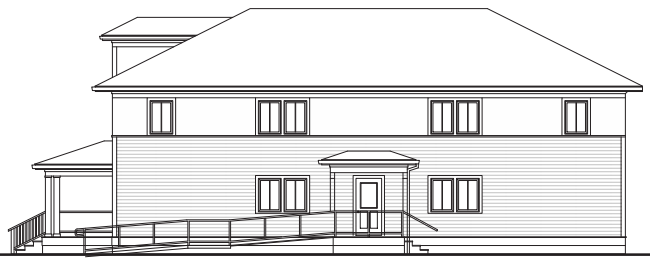
Elevations



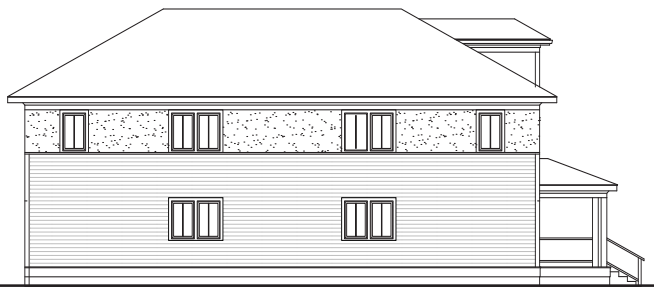
Front Elevation



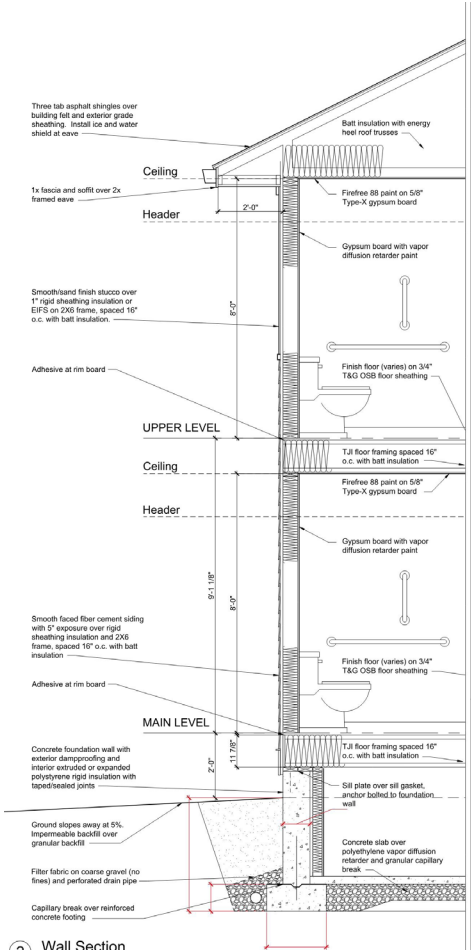
Back Elevation



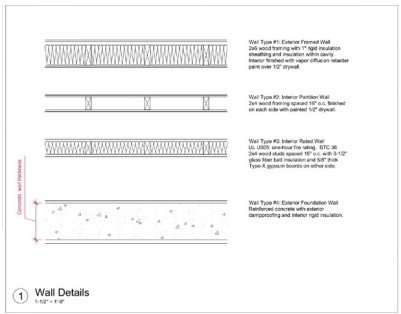
Right Side Elevation



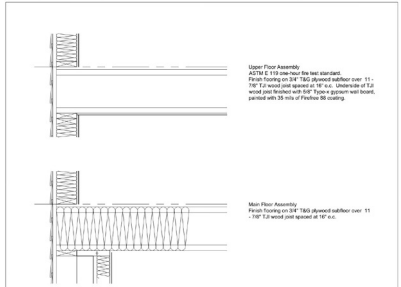
Left Side Elevation



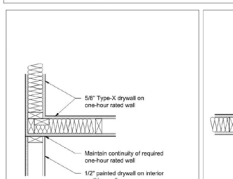
2 **Wall Section**
3/4" = 1'-0"



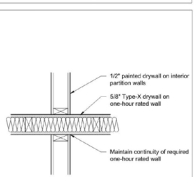
1 **Wall Details**
1-1/2" = 1'-0"



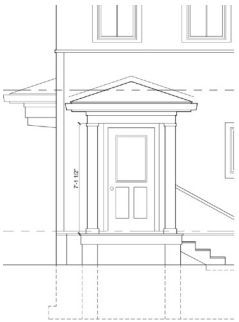
4 **Floor Details**
1-1/2" = 1'-0"



2 **Rated Wall Detail**
1-1/2" = 1'-0"

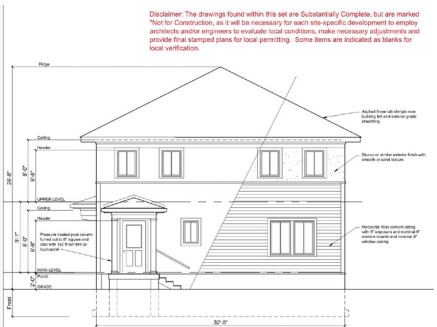


3 **Rated Wall Detail**
1-1/2" = 1'-0"



2 **Rear Porch Detail**
1/2" = 1'-0"

Disclaimer: The drawings found within this set are Substantially Complete, but are marked "Not for Construction, as it will be necessary for each site-specific development to employ architects and/or engineers to evaluate local conditions, make necessary adjustments and provide final stamped plans for local permitting. Some items are indicated as blanks for local verification.



1 **Rear Elevation**
1/4" = 1'-0"

3 **Left Elevation**
1/4" = 1'-0"

Materials List

	Sizing	Notes
Foundation	8” x 12” Concrete footing 10” Reinforced concrete wall Reinforcement Size: Varies Framework Size: Varies	Concrete flooring to be 4” slab on grade with required reinforcement
Framing	Wood 2”x4”x8” 3 5/8 MTL stud: 2”x4”x Varies	Extra framing members will be required around window and door openings
Roofing	Shingles: 12”x 36” 3-Tab Asphalt Wood Trusses: 24” O.C. Gutter: Standard Fascia: Min 6”	Wood trusses by manufacturer Gutter and fascia to be prefinished
Insulation	1”or 1.5” Rigid: 4”x8” Board Batt Insulation: 15”x93”	Minimum R-13 Cavity, R-5 Continuous
Wrapping	Air and Water Barrier: 9’x150’ Roll	

* This is not a complete list of materials that will be needed for construction, this is a rough estimate.
* Contractor to ensure 20% included for overbuild.
* Price breakdown is for estimation purposes only. Pricing cost is subject to change.

Materials List Cont.

	Sizing	Notes
Exterior Siding	Cement Fiber Board Lap Siding: 6”x8” Board Cedar Lap Shingle: 4”x4” Shingle Stucco: 3 Coats Shingle Fiber Cement: 4”x4” Shingle	All siding to be painted on site
Windows	Casement Windows: 36” W x 48” H, 36” W x 36” H, 48” W x 60” H Single Hung: 36” W x 48” H, 36” W x 36” H, 48” W x 60” H Double Hung: 36” W x 48” H, 36” W x 36” H, 48” W x 60” H	Double pane insulated glass recommended, 0.32 U-Factor
Major System Costs	Plumbing: Varies Electrical: Varies Mechanical: Varies Solar (optional): Varies	Price to include system, ductwork and installation

* This is not a complete list of materials that will be needed for construction, this is a rough estimate.
* Contractor to ensure 20% included for overbuild.
* Price breakdown is for estimation purposes only. Pricing cost is subject to change.

To the City

The Michigan Pattern Book Homes Manual series contains several plan sets that municipalities have already vetted. These pre-reviewed plans provide a more seamless approval process for the city, the builders, and the owners. Under this approach, the municipality can offer a library of construction plans already reviewed by the local code official and designated areas for use. A builder may then select one of the designated plan sets for their project rather than incurring the time and financial expenses of having new plans drawn up and reviewed by code officials.

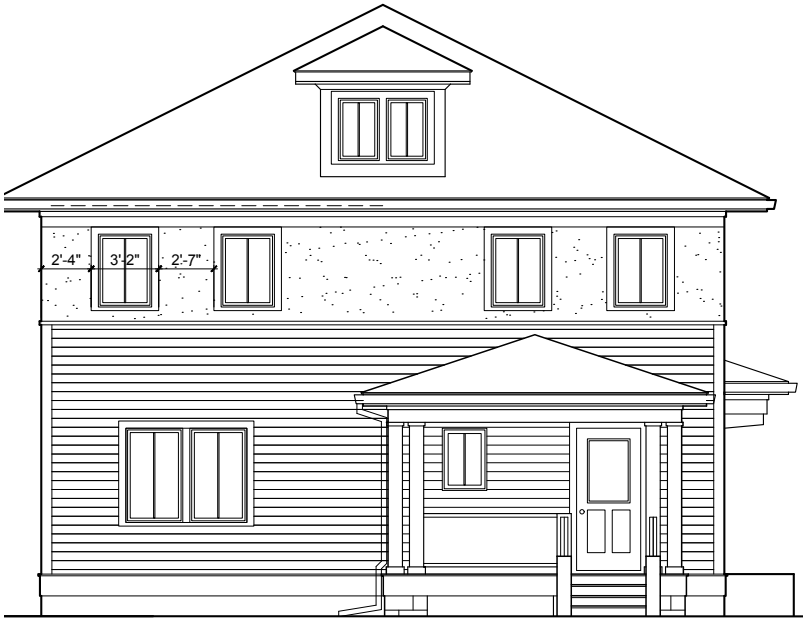
This approach does not eliminate all code reviews. However, it provides significant time and cost savings—both on the developer's side and on the municipal administration of plan review.

Some steps remain:

1. The builder may still need to have their copy of the plans stamped by an architect; this can either be an individual builder's responsibility or a service the municipality contracts with a designated architect to provide.

2. The placement of a pre-approved building on a specific site must still have setbacks, etc., verified.

3. Controls like wetland or steep slope protections or storm water management requirements should be maintained.



To the Contractor

The design process and considerations endeavored to set forth a menu of options to visualize a few floorplans with a variety of interchangeable skins.

While the level of detail presented is more complex, the user can peel back finish levels to result in a more pared-down version of the design without sacrificing the bones of the building.

Generally, materials selections are provided at a grade level that will not adversely affect the attainable cost approach of the model yet still have fidelity to the core belief that durable, repairable materials will last longer and be a better investment over time. Alternate exterior materials are illustrated on the Options Sheet but are not detailed comprehensively within the drawing set. Given other design sacrifices made in the modeling process, it is implied that the cheapest materials should be avoided. More explicitly, cladding choices such as Hardie Plank clapboards or shingles, and/or masonry veneer are far preferable to vinyl or other low-end finishes due to their durability, repairability, and environmental impact.

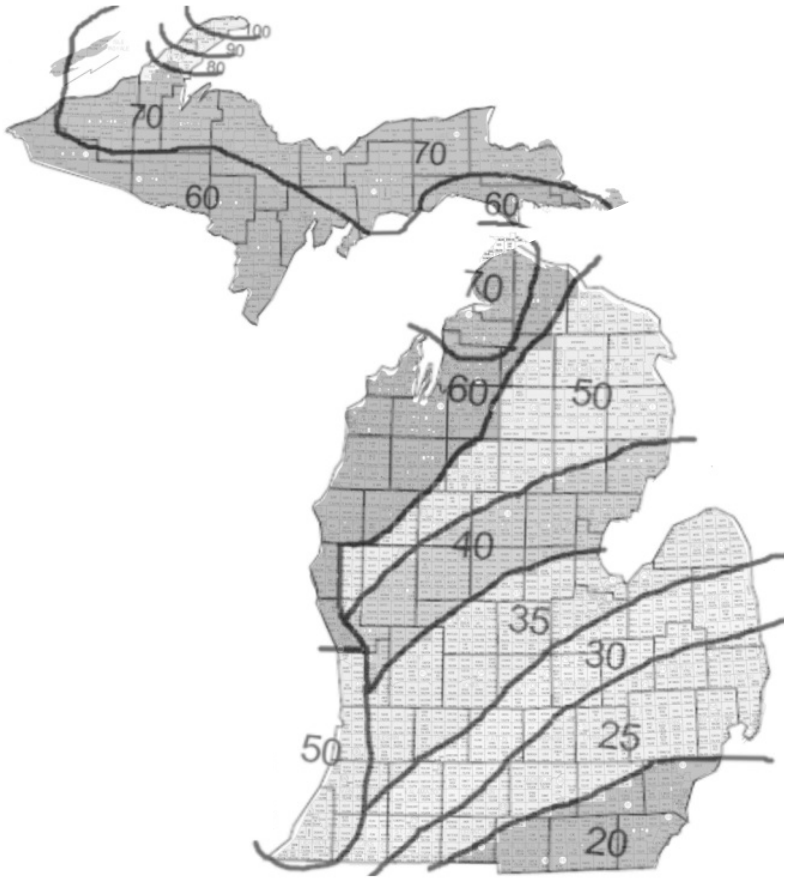
Roofing should be dimensional asphalt shingles. Contractor to also verify local energy codes, climate zones, and other variations in the construction.

Similarly, the construction documents generally assume interior selections from a mid-range list of counters, floors, trim, and molding types.

The contractor is to verify and confirm site plan approval as well as building permits including mechanical, and structural. Contractor to schedule regular inspections during construction and at the end of the construction.

Buildings shall be constructed in accordance with the provisions of the code. Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2(5) of the 2015 Michigan Residential Code.

FIGURE R301.2(5) GROUND SNOW LOAD Pg FOR MICHIGAN (lb/ft2) R 408.30515



Energy Efficiency

As Michigan continues to feel the effects of climate change, the pragmatic homebuilder will do well to look for ways to implement sustainability in their projects and use modern appliances to reduce wasted energy and water consumption. Homebuilders should also consider choosing sustainable sources with new materials. This commitment to sustainability can be further deepened by using at least one alternative product that has been locally produced and recycled. Thinking ahead to the future of reduced fossil fuel usage, we also encourage homebuilders to provide at least one electric car charger per unit and incorporate solar panels on the building or site, where practical.

Solar Analysis and Recommendations

Interior

Locate commonly used spaces where they will benefit the most from daylighting. Kitchens and living spaces should be located to the south or outside walls. Buffer spaces, like closets and mechanicals to the north, south, and west-facing porches provide additional moderation of temperature swings.

Achieving the best layout may require rotating and/or mirroring the established floor plans.

Exterior

Light-colored fences placed at the north side of the building can provide reflecting daylighting. Natural ground cover placed south of the building, instead of light-colored concrete will reduce reflected summer heat gain.

Deep overhangs block high summer sun while allowing low-altitude winter heat gain. In the cold, wet climate of the midwest, deep overhangs are paired with steeper roof pitches to serve the additional purpose of keeping runoff rain and snow away from foundations and basement windows.

Locate solar panels to the south for solar gain. If solar panels are not feasible, due to site conditions, purchasing or renting solar panels from a community solar site may be an alternative.

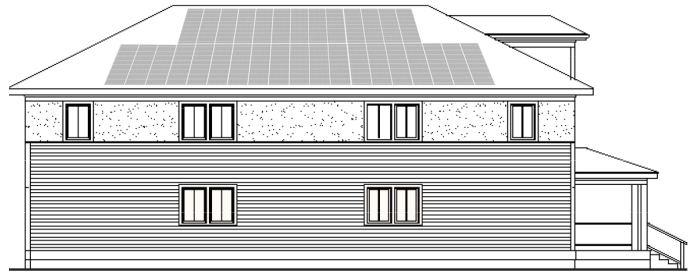
Elevation walls that face south (or nearly so) provide the best opportunities for daylighting and passive solar gains through south-facing windows. Reorienting the roof pitch away from mature trees and toward the sun will allow for increased active solar opportunities.

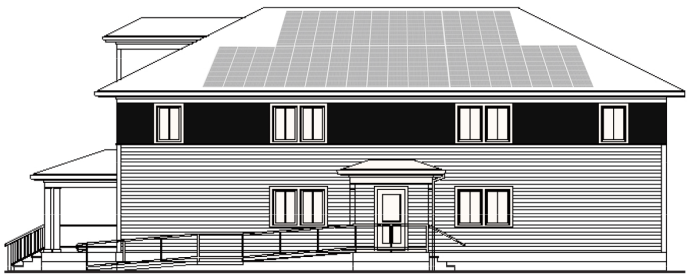
Use landscaping to protect the house from winter winds, to allow winter solar gains and daylighting, while shading and cooling in the summer. The west and south-facing elevations should be protected from summer sun and should be shaded, with plantings, porches, arbors, and

other similar shading devices that can also provide elective control. Gardens, vegetation, and porous pavers help manage onsite rain runoff.

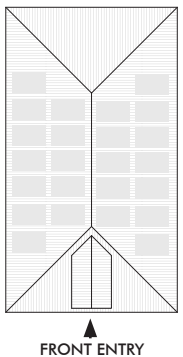
Southern exposures should be clear of any obstructions, except for deciduous trees that provide relief from the summer sun. East and west-facing windows can cause the most summertime heat and should be minimized.

All of the options are solar ready, we recommend using solar panels to reduce the impact of climate change. Housing can be outfitted with batteries and inverters to store the energy until it is needed. More information can be found through MEDC Solar Energy Development Resources and through the RRC Green Infrastructure Guide.





Location of Solar Panels



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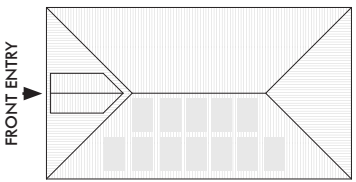
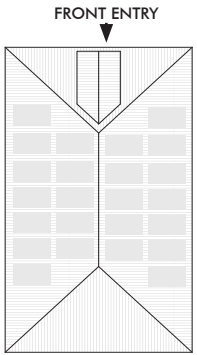


GOOD



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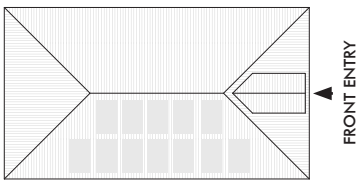

GOOD

RESOURCES

1. MEDC Local Partners
2. Neighborhood Enhancement Program
3. Brownfield Redevelopment Program
4. State Infrastructure Bank
5. Federal Rehabilitation Tax Credits
6. MSHDA Mod
7. Multi Family Direct Lending Programs

AARP Discovering and Developing Missing Middle Housing
https://www.aarp.org/livable-communities/housing/info-2022/missing-middle-housing.html

Enabling Better Places: Users' Guide to Zoning Reform
https://www.cnu.org/michigan

Missing Middle Housing
https://missingmiddlehousing.com/

Fair Housing Act Design Manual (Universal Design)
https://www.huduser.gov/portal/publications/destech/fairhousing.html

Consumers Energy & DTE New Homes Construction Program Overviews
https://michiganrebates.com/sites/default/files/2023-01/mi_-_new_home_construction_2023_program_overview_for_mirebates_dec_2022_web.pdf

DTE Rebates Incentive Chart
https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/home-energy-rebate-programs

Consumers Energy Rebates Incentive Chart
https://www.consumersenergy.com/residential/savings-and-clean-energy/rebates

Solar Energy Guide for Homebuilders
https://www.energy.gov/eere/solar/solar-energy-guide-homebuilders

Stormwater Solutions for Homeowners Fact Sheet: Reducing Impervious Surfaces
https://www.mass.gov/doc/stormwater-solutions-for-homeowners-fact-sheet-reducing-impervious-surfaces/download#:~:text=Use%20pervious%20materials%20%2D%20Rather%20than,or%20