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OSHTEMO CHARTER TOWNSHIP PLANNING COMMISSION MEETING

OSHTEMO TOWNSHIP HALL
7275 WEST MAIN STREET

THURSDAY, OCTOBER 8, 2026
6:00 P.M.

AGENDA

1. Call to Order
2. Pledge of Allegiance
3. Approval of Agenda
4. Approval of Minutes: September 24, 2026 Meeting ([Pg 3](#))
5. **Accessory Dwelling Unit – Metcalf (8170/8195 Frie Avenue)**
Planning Commission to consider request to allow an existing dwelling to become an accessory dwelling unit. Subject property is 8170/8195 Frie Avenue (parcel 05-33-402-005) ([Pg 9](#))
6. **Work Item: Draft One – Energy Systems Ordinance**
Planning Commission to resume review of working draft of an Energy Systems Ordinance addressing solar, wind and energy storage, and Appendix A Sound Report Requirements. Planning Commission previously left off on Section 49.290.D.3.EE of the energy system ordinance. ([Pg 37](#))
7. Public Comment
8. Planning Commissioner Comments
9. Adjournment

Broadcast Notice:

This meeting is being streamed live on the Township's Facebook page and on the Public Media Network website and app and recorded for watching on-demand. It is also broadcast on Spectrum and AT&T community access channels.

**Policy for Public Comment
Township Board Regular Meetings, Planning Commission & ZBA Meetings**

All public comment shall be received during one of the following portions of the Agenda of an open meeting:

- a. Citizen Comment on Non-Agenda Items or Public Comment – while this is not intended to be a forum for dialogue and/or debate, if a citizen inquiry can be answered succinctly and briefly, it will be addressed or it may be delegated to the appropriate Township Official or staff member to respond at a later date. More complicated questions can be answered during Township business hours through web contact, phone calls, email (oshtemo@oshtemo.org), walk-in visits, or by appointment.
- b. After an agenda item is presented by staff and/or an applicant, public comment will be invited. At the close of public comment there will be Board discussion prior to call for a motion. While comments that include questions are important, depending on the nature of the question, whether it can be answered without further research, and the relevance to the agenda item at hand, the questions may not be discussed during the Board deliberation which follows.

Anyone wishing to make a comment will be asked to come to the podium to facilitate the audio/visual capabilities of the meeting room. Speakers will be invited to provide their name, but it is not required.

All public comment offered during public hearings shall be directed, and relevant, to the item of business on which the public hearing is being conducted. Comment during the Public Comment Non-Agenda Items may be directed to any issue.

All public comment shall be limited to four (4) minutes in duration unless special permission has been granted in advance by the Supervisor or Chairperson of the meeting.

Public comment shall not be repetitive, slanderous, abusive, threatening, boisterous, or contrary to the orderly conduct of business. The Supervisor or Chairperson of the meeting shall terminate any public comment which does not follow these guidelines.

(adopted 5/9/2000)
(revised 5/14/2013)
(revised 1/8/2018)

Questions and concerns are welcome outside of public meetings during Township Office hours through phone calls, stopping in at the front desk, by email, and by appointment. The customer service counter is open from Monday-Thursday, 8 a.m.-1 p.m. and 2-5 p.m., and on Friday, 8 a.m.-1 p.m. Additionally, questions and concerns are accepted at all hours through the website contact form found at www.oshtemo.org, email, postal service, and voicemail. Staff and elected official contact information is provided below. If you do not have a specific person to contact, please direct your inquiry to oshtemo@oshtemo.org and it will be directed to the appropriate person.

Oshtemo Township Board of Trustees

Supervisor

Cheri Bell 216-5220 cbell@oshtemo.org

Clerk

Dusty Farmer 216-5224 dfarmer@oshtemo.org

Treasurer

Clare Buszka 216-5260 cbuszka@oshtemo.org

Trustees

Neil Sikora 760-6769 nsikora@oshtemo.org

Kristin Cole 375-4260 kcole@oshtemo.org

Zak Ford 271-5513 zford@oshtemo.org

Michael Chapman 375-4260 mchapman@oshtemo.org

Township Department Information

Assessor:

Kristine Biddle 216-5225 assessor@oshtemo.org

Fire Chief:

Greg McComb 375-0487 gmccomb@oshtemo.org

Ordinance Enforcement:

Alan Miller 216-5230 amiller@oshtemo.org

Parks Director:

Vanessa Street 216-5233 vstreet@oshtemo.org

Rental Info 216-5224 oshtemo@oshtemo.org

Planning Director:

Jodi Stefforia 375-4260 jstefforia@oshtemo.org

Public Works Director:

Anna Horner 216-5228 ahorner@oshtemo.org

**OSHTEMO CHARTER TOWNSHIP
PLANNING COMMISSION
MINUTES OF A MEETING HELD SEPTEMBER 24, 2026**

AGENDA

WORK ITEM: ZONING ORDINANCE UPDATE

**WORK ITEM: ENVIRONMENTAL PROTECTION ORDINANCES
AMENDMENTS**

A meeting of the Oshtemo Charter Township Planning Commission was held Thursday, September 24, 2026, commencing at 6:00 p.m. at the Oshtemo Township Hall, 7275 West Main Street.

MEMBERS PRESENT: Grace Engels
 Deb Everett, Vice Chair
 Scot Jefferies
 Alistair Smith, Chair
 Jeremiah Smith (arrived 6:06)
 Ron Ver Planck

MEMBERS ABSENT: Michael Chapman, Township Board Liaison

Also present were Jodi Stefforia, Planning Director; James Porter, Township Attorney; Colten Hutson, Zoning Administrator; Leeanna Harris, Planning and Zoning Administrator; Anna Horner, Public Works Director; Jennifer Wood, Recording Secretary; and approximately 8 members of the public.

CALL TO ORDER AND PLEDGE OF ALLEGIANCE

At 6:00 p.m., Chair A. Smith called the meeting to order. Those in attendance joined in reciting the Pledge of Allegiance.

APPROVAL OF AGENDA

Chair A. Smith asked if there were any additions or modifications to the agenda. There were none.

Commissioner Jefferies **made a motion** to approve the agenda as presented. Vice Chair Everett **supported the motion**. The **motion passed** unanimously.

APPROVAL OF THE MINUTES FROM THE MEETING OF SEPTEMBER 10, 2026

Chair A. Smith asked if there were any additions, deletions, or corrections to the minutes of the September 10, 2026 meeting. There were none.

Commissioner Jefferies **made a motion** to approve the Minutes of the September 10, 2026, meeting as presented. Vice Chair Everett **supported the motion**. The **motion passed** unanimously.

WORK ITEM: ZONING ORDINANCE UPDATES

Before the presentation, Ms. Stefforia stated that Trustee Chapman was unable to attend because of a temporary military assignment. She noted that he is a colonel in the United States Air Force. Chair A. Smith thanked him for his service.

Jason Ball of Progressive Companies continued the review of proposed zoning-ordinance revisions intended to implement the 2045 Comprehensive Plan. He noted two corrections to the packet: the Mixed Use district abbreviation will be “MU,” rather than “MXU,” and the word “frontage” will be removed where it was inadvertently shown for several industrial districts. The draft continues the consolidation of commercial districts and would rename the C-Local Business district as Regional Commercial to better describe the intensity of uses and align with the Comprehensive Plan’s Regional Corridor designation.

Mr. Ball reviewed the proposed commercial use table, including conditions for commercial centers; separate treatment of drive-through or drive-in uses and pickup windows; distinctions between craft beverage production and tasting-room or brew-pub uses; and new neighborhood-retail and large-retail categories. In response to Commission questions, he agreed that pottery should not be listed solely as an industrial production use and said the definitions would accommodate small-scale production associated with on-site retail. Fire stations would remain separately identified because of truck movements and potential noise. Standards for food trucks and events will be reviewed with the use-specific conditions at a future meeting.

The Commission discussed whether single-family dwellings should remain permitted in the Mixed Use district. Mr. Ball explained that the district is intended for larger, planned redevelopment projects in Comprehensive Plan special-study areas, regional corridors, and nodes, rather than ordinary single-family subdivisions. Commissioners emphasized the original goals of adding housing, preserving development flexibility, providing transitions next to existing neighborhoods, and creating places where housing and businesses are integrated and walkable. The Commission’s direction was to retain single-family dwellings for the present and revisit the issue after the remaining district standards have been developed.

The proposed non-residential schedule of regulations would place dimensional standards in one table; eliminate separate provisions for commercial or industrial property without public water and sewer; use a consistent building-coverage standard; and establish clear maximum heights. Height-related industrial setbacks would be replaced by the proposed landscape-buffer requirements, with additional setbacks still available through special land-use review where warranted.

Mr. Ball then reviewed the proposed Neighborhood Mixed Use district, which would replace the Village Commercial district and the separate form-based-code overlay. The draft carries forward selected design requirements in a shorter, more accessible format and moves parking, sign, and related requirements to the ordinance articles where they apply Township-wide. It would permit a maximum front setback of 40 feet, sufficient for one parking row, an access aisle, and landscaping, while still requiring buildings to address the street or parking area. A 60-percent building-frontage standard and simplified exterior-material standards were also discussed.

Commissioners considered whether front-yard parking would weaken the long-standing vision for a walkable village center, particularly at Ninth Street and Stadium Drive. Discussion recognized both the pedestrian-oriented goal and the current character of Stadium Drive as a wide, heavily traveled roadway where most customers arrive by automobile. Commissioners also questioned how the standard would apply in other Neighborhood Mixed Use areas and requested illustrations of likely development patterns. Mr. Ball agreed to return with options for parking placement, administrative or reviewing-body flexibility, and graphics showing how the revised standards could be applied.

For the Mixed Use district, the draft would align location criteria with the current Comprehensive Plan; clarify a two-stage process consisting of a nonbinding conceptual-plan review with a public hearing followed by rezoning review and a second public hearing; define minor amendments that staff could approve; simplify mobility standards to emphasize nonmotorized travel; and begin with Township design standards rather than requiring each applicant to create a separate set.

Commissioners also discussed the existing density bonus for LEED-certified construction. Mr. Ball explained that the bonus offsets added construction cost and advances sustainability goals; staff stated that outside technical review could be used to verify compliance when necessary.

The Commission also discussed whether private outdoor recreation should be available as a special land use in the Innovation and Industry or Mixed Use Districts. Members noted the community need for soccer, baseball, hockey, pickleball, and emerging facilities such as Topgolf, while staff and the consultant identified traffic, land-consumption, and reuse concerns. Mr. Ball agreed to develop options distinguishing smaller or single-facility uses from large field complexes and to return with examples.

No formal action was taken. A preliminary zoning map and draft revisions addressing parking, landscaping, lighting, use-specific conditions, Neighborhood Mixed Use parking, and private outdoor recreation are expected to return for continued review, tentatively on October 22, 2026.

WORK ITEM: ENVIRONMENTAL PROTECTION ORDINANCES AMENDMENTS

Public Works Director Anna Horner continued the review of proposed environmental-protection amendments. She explained that the work responds in part to the Township's water-service agreement, which requires wellhead-protection regulations and performance standards, and would consolidate related zoning and general-ordinance provisions into a more consistent Township-wide framework. The provisions would continue to inform site-plan review even where they are moved to the General Ordinance. A technical user group of City and Township staff is expected to begin meeting in October to refine the wellhead requirements and ensure that they work for different forms of local government.

Ms. Horner clarified that proposed administrative departures would allow staff to apply objective standards to site-specific conditions without removing review by the body responsible for the site plan. Using stormwater as an example, she said a project would still have to accommodate the required 100-year storm volume, but measurable credit could be given for low-impact practices such as rain gardens, bioswales, green roofs, or distributed landscaping. Commissioners supported allowing qualified staff to administer technical standards within clear policy guardrails while retaining an avenue for further review when an applicant disagrees.

The stormwater provisions would also add maintenance agreements scaled to the type and risk of the facility so that ponds, underground storage, and other systems remain functional after construction. In response to a question about backflow protection, Ms. Horner explained that larger commercial services and systems with fire sprinklers require backflow preventers and annual testing, while water-main breaks and hydrant flushing are managed through established notification and testing procedures.

For groundwater and wellhead protection, the draft would apply the ordinance to development Township-wide and use both zoning classification and the actual activity to determine risk. Development in a wellhead-capture zone would follow the full performance standards; elsewhere, a high-risk use could trigger those standards even in a lower-risk district. Commissioners questioned the low-risk designation for Agricultural and Rural Residential land because of possible chemical or petroleum use. Attorney Porter noted that many improper disposal practices are already prohibited by law and that an ordinance must address typical lawful activity rather than every isolated violation. He also explained that zoning identifies permitted uses, with uses not permitted being prohibited.

A commissioner asked whether battery-energy facilities, data centers, and high-volume cooling systems should be addressed in the risk table. Ms. Horner stated that principal-use energy systems had been added as a high-risk manufacturing activity and that performance standards already use technical thresholds for cooling chemicals. Staff explained that a reserved manufacturing category was intended to accommodate additional language before adoption.

High- and medium-risk uses would provide inventories and other documentation, coordinated where possible with firefighter right-to-know information, and would be subject to continuing maintenance and inspection requirements. The draft would also recognize selective cutting as a potential land-management practice and would require soil-erosion controls for qualifying earth changes. Commissioners discussed sites smaller than one acre and projects that divide disturbance among separate portions of a larger site; Ms. Horner agreed that acreage, the amount and location of earth change, steep slopes, and off-site impacts may all be appropriate criteria.

A commissioner requested consistent use of the term “Comprehensive Plan” in Township documents being amended, while retaining the definition equating it with “Master Plan.” Staff will continue refining the draft, complete the remaining environmental articles, and prepare the related forms, inventories, and maintenance agreements. The amendments will ultimately proceed to the Township Board through the required public-hearing process. No formal action was taken.

PUBLIC COMMENT

Chair A. Smith opened the floor for public comment. No one spoke, and Chair A. Smith closed public comment.

PLANNING COMMISSIONER COMMENTS

Attorney Porter provided context regarding an article he had distributed about the recent Moss Landing battery-storage facility. He explained that the reported fire involved charged battery modules remaining in an older enclosed building following a 2025 fire and noted that the facility’s design and older technology should be considered when evaluating the event.

Commissioner Jefferies thanked Ms. Horner and the Public Works Department for approximately four and one-half years of work with the Road Commission on traffic calming along Green Meadow Road. He stated that the principal improvements were in place and already reducing traffic speeds, with limited signage and pavement markings remaining.

ADJOURNMENT

There being no further business, the meeting was adjourned at 7:47 p.m.

Minutes Prepared: September 25, 2026

Minutes Approved:

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Staff Report

Meeting Date: October 08, 2026

To: Oshtemo Township Planning Commission

From: Planning Department

Applicant: Colin Metcalf

Owner: Colin & Martia Metcalf

Property: 8170 & 8195 Frie Avenue (Parcel #05-33-402-005)

Zoning: RR: Rural Residential District

Request: A deviation to allow the proposed ADU to be placed within the minimum required front and side yard setback area and a deviation to allow the proposed ADU to be located closer to the principal dwelling on an adjacent property compared to the principal dwelling on site.

Section(s): Section 48.160 – Accessory Dwelling Units

Planning & Zoning Department Report:

Overview:

The applicant, Colin Metcalf, is requesting approval to allow an Accessory Dwelling Unit (ADU) on his property located at 8170 and 8195 Frie Avenue.

The property is currently occupied by two buildings; one serving as the owner's principal residence at 8195 Frie Avenue, and the other structure at 8170 Frie Avenue which was formerly a single-family home that presently sits vacant.



The applicant contacted the Planning Department this summer and inquired about the possibility of

converting the existing building at 8170 Frie Avenue into an ADU. In conducting a preliminary review of his request, staff found that the subject building conforms to all provisions within Section 48.160 of the Zoning Ordinance with the exception of the following:

1. The ADU must be located in compliance with Section 57.100.C.
 - The proposed ADU is approximately set back 2 to 3 feet from the front yard property line while a minimum front yard setback of 30 feet is required.
 - In addition to the above setback requirement, since the property is located within a plat, the proposed ADU may not be located closer to the street right-of-way than the front line of the principal dwelling on site.
 - The proposed ADU is approximately set back 8 feet from the side yard property line while a minimum side yard setback of 14 feet 6 inches is required (minimum of 10 feet or equivalent to the overall height of the building, whichever is greater).
2. The ADU must be located closer to the principal dwelling on the property than the ADU is located to the principal dwelling on an adjacent property.
 - The proposed ADU is 17 feet closer to the neighboring principal dwelling on the property to the immediate east compared to the principal dwelling on site.

ADUs are a permitted use with conditions which typically can be reviewed and processed administratively. However, when certain dimensional standards are identified as not being met, the Planning Commission may grant property owners relief from such dimensional requirements for those wishing to establish an ADU within an existing detached accessory building which does not serve as the principal accessory building (garage) to the principal residence on site. As each provision is eligible for a departure from the ADU Ordinance, the property owner has submitted formal application to the Planning Commission to determine if the two deviation requests are appropriate.

The subject property is located in the Frie and Gibbs Plat on the south side of Frie Avenue, between O'Park Street and South 6th Street. The lot is approximately 4 acres in area and is zoned RR: Rural Residential. The land encompassing the principal residence and the proposed ADU is outlined in blue on the aerial image.

Background Information:

The building which the applicant wishes to convert to an ADU was constructed as a 708 square foot bungalow back in 1920. In 2017, the property owner at the time secured a building permit to construct a new 2,904 square foot two-story home on the property contingent upon executing a deed restriction required by the Township. This recorded document restricted that only one structure on the property may be utilized as a dwelling unit at any one time. This is primarily attributed to the allowances of the Zoning Ordinance, which did not permit the use of ADUs at the time. The applicant would like to maximize his property, opening the door for further housing opportunities in the community. If the requested deviations are approved by the Planning Commission, the Township can release the deed restriction burdening the property so the building located at 8170 Frie Avenue can be utilized as an ADU by the property owners and their successors.

Planning & Zoning Department Review:

Section 48.160 of the Zoning Ordinance currently does not offer review standards for when a deviation is requested. It is rather structured in a fashion to allow the Planning Commission to use their judgement, take the applicant's reasoning into account, and determine if the application meets the vision of the 2045 Oshtemo Comprehensive Plan and overall spirit and intent of the Zoning Ordinance.

Although the ADU Ordinance lacks review criteria, staff suggest the following findings be taken into consideration.

1. The building located at 8170 Frie Avenue was constructed in 1920 and predates the Township's ADU Ordinance.
2. If the strict letter of the ADU Ordinance had to be followed with respects to setbacks and placement requirements, the existing building at 8170 Frie Avenue would be required to be relocated, creating a true hardship for the property owner.
3. It can be argued that the Ordinance in this circumstance is unnecessarily burdensome.
4. Permitting the building at 8170 Frie Avenue to be allowed to be used as an ADU would create additional housing opportunities in the community and further the Township's vision to combat the shortage in housing.
5. The character of the area would not change as the building already exists.
6. A land division could be completed so each building is located on their own, separate parcel.

Staff will continue to work on amending the Zoning Ordinance with Progressive Companies and incorporate review criteria that the Planning Commission may consider for future deviation requests for ADUs.

Recommendation:

The Planning Commission may approve, approve with conditions, or deny the deviation requests.

Township staff recommend that the Planning Commission review the information provided in this report, the application and supplemental attachments, listen to the applicant's presentation, have an open dialogue with the applicant, consider public comment, if any, and then make a finding as to whether the proposal for an Accessory Dwelling Unit conforms to the standards and recommendations of the 2045 Oshtemo Comprehensive Plan and meets the spirit and intent of Section 48.160 of the Zoning Ordinance.

If the Planning Commission finds that the deviation requests are supported, the following conditions are suggested by Township staff:

1. Documentation from the Kalamazoo County Environmental Health Department confirming that the well and septic currently on site are adequate must be provided to the Township prior to a Certificate of Occupancy.
2. The Building Official must inspect the Accessory Dwelling Unit to verify that all code requirements are met prior to a Certificate of Occupancy.
3. The applicant must submit and execute the required affidavit and deed restriction prior to a Certificate of Occupancy.

Attachments: Application, Narrative, Annotated 2025 Aerial image, Floor Plan, Photographs, and Recorded Deed Restriction



Planning Department
7275 W. Main Street
Kalamazoo, MI 49009
Phone: 269.216.5223
planning@oshtemo.org

PLANNING & ZONING APPLICATION

1. Instructions & Fee Information

- Complete this application providing the requested supplemental documentation described herein, including the fee, and submit to the Planning Department for review. Incomplete applications will not be accepted.

2. Applicant Information

Name: Colin & Martia Metcalf		
Mailing Address: 8195 Frie Ave	City, State: Kalamazoo, MI	Zip Code: 49009
Email: cm@colinmetcalf.com	Phone: 312-371-2073	

3. Property Owner Information

Name: Colin & Martia Metcalf		
Mailing Address: 8195 Frie Ave	City, State: Kalamazoo, MI	Zip Code: 49009
Email: cm@colinmetcalf.com	Phone: 312-371-2073	

4. Project Information

Project Name: ADU Permitted on Site					
Project Address: 8195 Frie Ave, Kalamazoo, MI 49009	Parcel Number: 05-33-402-005				
Email:					
Property Legal Description (use attachments if necessary): PLAT OF FRIE & GIBBS LOT 3 BLK 1** SPLIT/COMBINED ON 12/22/2015 FROM 05-33-402-012;					
Current Zoning: RR	Current Use: Residential	Area of Property: GIS Image Attached			
Type of Request (check all that apply): <table border="0"><tr><td>☐ Site Plan Review (type, if applicable): ☐ Pre-Application ☐ Administrative ☐ Plat/Site Condo</td><td>☐ Rezoning ☐ Zoning Variance ☐ Special Exception Use ☐ Clear Cutting</td><td>☐ Text Interpretation ☒ Accessory Building/Dwelling Unit ☐ Other: _____</td></tr></table>			☐ Site Plan Review (type, if applicable): ☐ Pre-Application ☐ Administrative ☐ Plat/Site Condo	☐ Rezoning ☐ Zoning Variance ☐ Special Exception Use ☐ Clear Cutting	☐ Text Interpretation ☒ Accessory Building/Dwelling Unit ☐ Other: _____
☐ Site Plan Review (type, if applicable): ☐ Pre-Application ☐ Administrative ☐ Plat/Site Condo	☐ Rezoning ☐ Zoning Variance ☐ Special Exception Use ☐ Clear Cutting	☐ Text Interpretation ☒ Accessory Building/Dwelling Unit ☐ Other: _____			
Statement of Intent: Briefly describe your request (use attachments, if necessary). ADU on site that existed prior to the Twp Ordinance creation. No site changes requested. ADU's are in shortage and the market has current need that will grow potentially. (See attached documentation).					

5. Required Documents for Site Plan Review

Required Documents for Site Plan Review (complete and attach to this application):

- ☐ Environmental Permits Checklist
- ☐ Hazardous Substance Reporting Form
- ☐ Site Plan, if applicable
- ☐ Access predetermination form RCKC or MDOT, if applicable

6. Signatures

Names & addresses of all other persons, corporations, or firms having a legal or equitable interest in the property:

Colin & Martia Metcalf 8195 Frie Ave, Kalamazoon, MI 49009

Names(s)

Address(es)

Names(s)

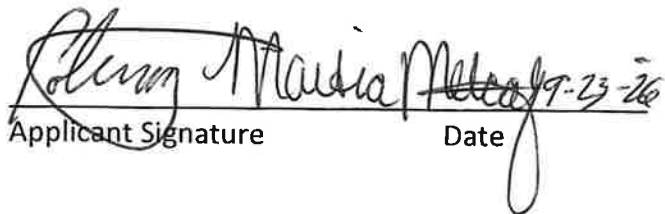
Address(es)

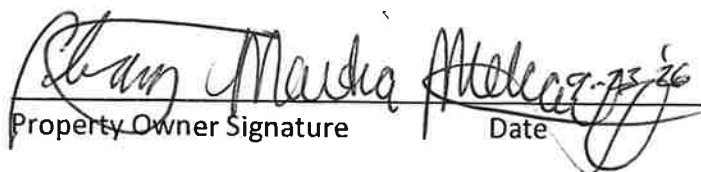
I (we) the undersigned certify that the information contained on this application form and the required documents attached hereto are to the best of my (our) knowledge, true and accurate.

I (we) acknowledge that we have received the Township's Disclaimer regarding Sewer and Water Infrastructure.

I (we) understand the incomplete applications will not be accepted. If the application is found to be incomplete after submission, formal review and approval may be delayed. Significant revisions to an application or its attachments may result in requiring the submission of additional fees and/or additional escrow.

By submitting this Planning & Zoning Application, I (we) grant permission for Oshtemo Township officials and agents to enter the subject property of the application as part of completing the reviews necessary to process the application.


Applicant Signature Date 9-23-26


Property Owner Signature Date 9-23-26

September 15, 2026

Oshtemo Charter Township
Colten Hutson
Zoning Administrator
7275 W Main Street
Kalamazoo, MI 49009
CHutson@Oshtemo.org
269-216-5231

Mr. Hutson,

An exception allowing the existing secondary dwelling to remain in place would advance Oshtemo Charter Township's own ADU policy goals while addressing a documented and growing local need for aging-in-place and multigenerational housing. The request is not for a new, intensified development; it is a narrowly tailored, property-specific accommodation for a home that existed before the applicable ordinance, where forced relocation of the structure and foundation would impose an extraordinary and unjust hardship without a corresponding public benefit.

Request for a Reasonable Exception for a Pre-Existing Auxiliary Dwelling Unit

The Township should approve a reasonable exception to the ordinance requirement that would otherwise require relocation of the existing auxiliary dwelling and its foundation. The dwelling existed on the property before adoption or applicability of the current ordinance requirement. Requiring its removal or physical relocation would create a substantial, unnecessary, and disproportionate hardship for the homeowner—one that is not needed to protect the public health, safety, welfare, neighborhood character, utilities, or surrounding property owners.

The requested relief is consistent with the purpose of an Accessory Dwelling Unit ("ADU"). Oshtemo Township recognizes ADUs as secondary, independent living spaces that can provide a practical housing option for family members, including adult children and older relatives. The Township's current ADU standards expressly allow an ADU to be attached or detached, permit one ADU per eligible property, limit occupancy to a family of up to three persons, require owner occupancy of one of the dwellings, and prohibit separate sale except through lawful removal or subdivision. These safeguards preserve single-family character while allowing a modest second dwelling to meet real family housing needs.

Allowing this existing unit to remain, subject to reasonable conditions and confirmation of building, utility, septic/water, fire-safety, and site-safety compliance, would further the public purpose of the ADU ordinance rather than undermine it. It would preserve an already-established structure, avoid needless demolition or reconstruction, and provide a

safe, nearby housing option for an aging parent, caregiver, adult child, or multigenerational family member.

Local Demographic Need

Oshtemo is especially well positioned to recognize the value of flexible, family-based housing because its population is older than the county average.

Measure	Oshtemo Charter Township	Kalamazoo County	Significance
Residents age 60+	6,611 people; 28.0% of population	20.9% of population	Oshtemo has a substantially higher share of residents 60+ than the county overall.
Residents age 65+	4,453 people; 18.9% of population	15.0% of population	Nearly one in five Oshtemo residents is already 65 or older.
Projected county residents age 65+	—	45,114 by 2029	The county's 65+ population is projected to grow from 41,777 in 2023 to 45,114 in 2029.
County housing stock at least 40 years old	—	More than 70%	Older homes commonly need adaptation to accommodate mobility, caregiving, and accessibility needs.

Kalamazoo County's 2023 Older Adult Community Needs Assessment identifies Oshtemo as one of the county communities with the greatest number of residents age 60 and older. In Oshtemo, 28.0% of residents are age 60+, and 18.9% are 65+, compared with 20.9% and 15.0%, respectively, countywide.

The same assessment projects that Kalamazoo County's population age 65 and older will rise from 41,777 in 2023 to 45,114 by 2029. That is an increase of 3,337 older adults in only six years. The population age 60 to 64 is also projected to increase from 16,538 to 18,197 over the same period, demonstrating that the next wave of older residents is already approaching retirement age.

These figures support a practical conclusion: the need for housing arrangements that allow older adults to remain near family, assistance, transportation, healthcare, and familiar

community networks will continue to grow. A pre-existing auxiliary dwelling is one such housing resource.

Aging in Place Benefits

Aging in place means more than remaining on the same parcel. It means remaining in a familiar community with access to family support, day-to-day assistance, and the ability to maintain independence with dignity.

Michigan's State Advisory Council on Aging reports that housing is central to successful aging in place and specifically identifies accessory dwelling units as one of the housing models that communities should consider. The Council notes that older adults often depend on families, friends, and volunteers when transportation, mobility, or health needs increase; close-by family housing can therefore be a meaningful support system. The local data likewise show why a nearby secondary dwelling matters:

- In a 2021 Kalamazoo County older-adult and caregiver survey, 27.5% of respondents identified home repair or safety modifications as a need, while 25.6% identified a need for medical equipment and 21.8% identified personal-care assistance.
- In Kalamazoo County, 34.3% of persons living with disabilities are age 65 or older, illustrating the connection between housing design, mobility, and the ability to live independently.
- More than 70% of Kalamazoo County's housing stock is at least 40 years old, which increases the likelihood that many homes require modifications or alternative living arrangements to meet later-life accessibility needs.
- The Michigan aging report states that 89% of older adults intend to remain in their homes, yet 9 in 10 do not have home modifications that support safe aging in place.

A lawful, safe auxiliary unit allows an older family member to live independently but close enough for support with transportation, meals, medication reminders, appointments, home maintenance, emergency response, and companionship. It can also allow an adult child or caregiver to live nearby and provide assistance without forcing multiple generations into one dwelling or requiring the older adult to leave the neighborhood.

Multigenerational Housing Value

The requested exception also serves families increasingly seeking multigenerational living arrangements. Families may use an auxiliary dwelling to house:

- An aging parent who wants privacy and independence while remaining close to adult children.

- An adult child returning home because of caregiving responsibilities, employment transitions, disability, divorce, or housing cost pressures.
- A caregiver or family member who provides regular support to an older homeowner.
- A family seeking a long-term estate plan that keeps generations connected without creating a separately saleable or uncontrolled second residence.

Oshtemo's existing ADU framework already anticipates these uses. The Township's published guidance specifically confirms that a grown child may live in an ADU, subject to the maximum occupancy and family requirements. It also requires an owner-occupancy affidavit and a deed restriction preventing the ADU from being sold separately from the principal residence, unless it is lawfully removed or the property is lawfully subdivided.

Those conditions distinguish this request from a speculative development proposal or a request for unrestricted rental density. The existing dwelling can remain an accessory, owner-supervised, family-oriented use that supports stability and preserves the residential character of the property.

Hardship and Public Interest

The Township should find that strict application of the relocation requirement would create an **unnecessary and unjust hardship** because:

1. **The structure predates the applicable requirement.** The homeowner did not create a new nonconformity in disregard of the current ordinance. The property's physical condition was established before the present regulatory standard applied.
2. **Relocation is disproportionately burdensome.** Moving an existing dwelling and foundation is not a minor administrative correction. It can require structural engineering, disconnection and reconnection of utilities, excavation, new foundation work, transportation, site restoration, building-code upgrades, and potentially septic or utility modifications. The cost and disruption may be economically infeasible for an ordinary homeowner.
3. **The hardship is not self-created.** The condition arises from the timing of the existing home and the subsequent ordinance requirements, not from a voluntary post-ordinance decision to construct an incompatible second dwelling.
4. **The requested relief is limited.** The homeowner seeks permission for the existing structure to remain—not authority for additional units, increased density, separate conveyance, short-term rental use, or an expansion beyond what is necessary.

5. **The public benefit of forced relocation is minimal or absent.** If the structure can meet reasonable life-safety, utility, sanitary, setback, screening, and site-management conditions, physical relocation would not materially advance a legitimate Township interest. Conversely, retaining it supports housing flexibility, family caregiving, aging in place, and efficient use of an existing housing asset.
6. **Approval aligns with responsible growth.** The Township describes its mission as advancing residents' quality of life through responsible growth, economic vitality, environmental stewardship, and social equity. Preserving an existing, regulated auxiliary dwelling for family and elder-care use fits those objectives more closely than requiring demolition, relocation, and unnecessary construction waste.

Applying the Standards

For the Oshtemo auxiliary-dwelling request, the application should avoid relying only on personal or financial hardship. "It will be expensive to move" is important evidence, but by itself may be insufficient. Tie the expense and disruption to objective, parcel-specific facts:

- The accessory dwelling and foundation existed before the present ordinance or site-placement requirement took effect.
- The existing location is a historical physical condition of this particular parcel.
- Relocation would require removal or structural alteration of an established home and foundation, rather than a routine design adjustment before construction.
- Moving the dwelling may trigger engineering, demolition, foundation work, excavation, utility disconnection and reconnection, site restoration, grading, septic/water review, or building-code work.
- The requested exception is the minimum relief necessary: permission to retain the existing structure where it sits, not permission for an expansion, another unit, a separate sale, or unrestricted rental use.
- The owner can accept conditions that protect neighbors and the public—such as safety inspections, occupancy limits, owner-occupancy, utility/septic compliance, parking, exterior maintenance, screening, no separate conveyance, and no enlargement without approval.
- Retaining the structure does not injure neighboring property, impair traffic or safety, overload utilities, or change the essential character of the area.
- The relief supports a valid residential objective—aging in place, family caregiving, and multigenerational housing—while remaining compatible with the Township's ADU regulations.

Suggested Relief

The Applicant respectfully requests a property-specific exception, variance, or other available administrative approval allowing the existing auxiliary dwelling and foundation to remain in their present location. The dwelling existed prior to the ordinance requirement at issue, and strict enforcement requiring relocation would impose an unnecessary, unreasonable, and unjust hardship on the property owner.

The requested relief is the minimum necessary to permit continued use of the existing structure as an accessory dwelling. The Applicant is not requesting authority to add additional dwelling units, to separately sell the dwelling, or to create an unregulated rental or commercial use. The Applicant is willing to comply with reasonable conditions concerning building and fire safety, utilities, sanitary service, parking, owner occupancy, occupancy limits, exterior compatibility, and any other conditions reasonably necessary to protect surrounding properties and the public interest.

Granting this limited exception would preserve a pre-existing housing resource that can serve an aging family member, caregiver, adult child, or other multigenerational household member. This outcome is particularly appropriate in Oshtemo Charter Township, where 28.0% of residents are age 60 or older and 18.9% are age 65 or older—both above Kalamazoo County's respective shares of 20.9% and 15.0%.

Denial would require costly and disruptive relocation of an existing home and foundation without a commensurate public benefit. Approval, by contrast, would support aging in place, family caregiving, multigenerational living, housing stability, and the efficient use of an existing residential asset while maintaining the protections and limitations applicable to ADUs in Oshtemo Township.

Thank you,



Colin & Martia Metcalf
8195 Frie Ave
Kalamazoo, MI 49009



8195 FRIE AVE 8170 KALAMAZOO, MI 49009 (Property Address)

Parcel Number: 05-33-402-005



Item 1 of 8

6 Images / 2 Sketches

Property Owner: METCALF COLIN & MARTIA

Summary Information

> Residential Building Summary

- Year Built: 1920
- Full Baths: 4
- Sq. Feet: 4,052
- Bedrooms: 6
- Half Baths: 1
- Acres: 4.270

- > Assessed Value: \$318,000 | Taxable Value: \$318,000
- > Property Tax information found
- > 8 Building Department records found

Important Message

2025 VALUATIONS ARE TENTATIVE AND SUBJECT TO CHANGE PENDING THE REVIEW PROCESS AND COUNTY AND STATE EQUALIZATION.

Owner and Taxpayer Information

Owner	METCALF COLIN & MARTIA 8195 FRIE AVE KALAMAZOO, MI 49009	Taxpayer	SEE OWNER INFORMATION
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General Information for Tax Year 2025

Property Class	401 RESIDENTIAL-IMPROVED	Unit	05 OSHTMO
School District	KALAMAZOO CITY SCHOOL DIST	Assessed Value	\$318,000
GFATHER CODE	No Data to Display	Taxable Value	\$318,000
FIRE	34	State Equalized Value	\$318,000
VETERANS	Not Available	Date of Last Name Change	08/21/2024
Historical District	Not Available	Notes	Not Available
POLICE	Not Available	Census Block Group	Not Available
		Exemption	No Data to Display

Principal Residence Exemption Information

Effective Date 08/21/2024

Principal Residence Exemption	June 1st	Final
2025	100.0000 %	100.0000 %

Previous Year Information

Year	MBOR Assessed	Final SEV	Final Taxable
2024	\$287,000	\$287,000	\$224,969
2023	\$251,200	\$251,200	\$214,257
2022	\$224,200	\$224,200	\$204,055

Land Information

Zoning Code	RR	Total Acres	4.270
Land Value	\$56,800	Land Improvements	\$0
Renaissance Zone	No	Renaissance Zone Expiration Date	No Data to Display
ECF Neighborhood	4060 NUMBER 6	Mortgage Code	No Data to Display
Lot Dimensions/Comments	CORNER LOT	Neighborhood Enterprise Zone	No

Lot(s)	Frontage	Depth
1st 1	627.00 ft	296.98 ft

Legal Description

PLAT OF FRIE & GIBBS LOT 3 BLK 1** SPLIT/COMBINED ON 12/22/2015 FROM 05-33-402-012;

Land Division Act Information

Date of Last Split/Combine	12/22/2015	Number of Splits Left	4
Date Form Filed	No Data to Display	Unallocated Div.s of Parent	0
Date Created	12/22/2015	Unallocated Div.s Transferred	0
Acreage of Parent	28.90	Rights Were Transferred	Not Available
Split Number	9	Courtesy Split	Not Available
Parent Parcel	No Data to Display		

Sale History

Sale Date	Sale Price	Instrument	Grantor	Grantee	Terms of Sale	Liber/Page
08/09/2024	\$575,000.00	WD	WICKEY ANTHONY M & JENNIFER K	METCALF COLIN & MARTIA	03-ARM'S LENGTH	2024-021077
03/06/2017	\$0.00	QC	WICKEY ANTHONY M	WICKEY ANTHONY M & JENNIFER K	21-NOT USED/OTHER	2017-007137
01/29/2016	\$59,000.00	WD	MALITO JOSEPH L & JUANITA	WICKEY ANTHONY M	32-SPLIT VACANT	2016-004916

Building Information - 708 sq ft BUNGELow (Residential)

General

Floor Area	708 sq ft	Estimated TCV	\$68,957
Garage Area	0 sq ft	Basement Area	624 sq ft
Foundation Size	708 sq ft		
Year Built	1920	Year Remodeled	1960
Occupancy	Single Family	Class	CD
Effective Age	45 yrs	Tri-Level	No
Percent Complete	100%	Heat	Forced Air w/ Ducts
AC w/Separate Ducts	No	Wood Stove Add-on	No
Basement Rooms	0	Water	Not Available
1st Floor Rooms	3	Sewer	Not Available
2nd Floor Rooms	0	Style	BUNGELow
Bedrooms	1		

Area Detail - Basic Building Areas

Height	Foundation	Exterior	Area	Heated
1 Story	Mich. Bsmnt	Siding	624 sq ft	1 Story
1 Story	Crawl Space	Siding	84 sq ft	1 Story

Basement Finish

Recreation	0 sq ft	Recreation % Good	0%
Living Area	0 sq ft	Living Area % Good	0%
Walk Out Doors	0	No Concrete Floor Area	0 sq ft

Plumbing Information

3 Fixture Bath 1

Building Information - 3354 sq ft TWO STORY (Residential)

General

Floor Area	3,354 sq ft	Estimated TCV	\$504,386
Garage Area	840 sq ft	Basement Area	1,902 sq ft
Foundation Size	1,902 sq ft		
Year Built	2017	Year Remodeled	No Data to Display
Occupancy	Single Family	Class	C
AC w/Separate Ducts	No	Wood Stove Add-on	No

Basement Rooms	0	Water	Not Available
1st Floor Rooms	7	Sewer	Not Available
2nd Floor Rooms	5	Style	TWO STORY
Bedrooms	5		

Area Detail - Basic Building Areas

Height	Foundation	Exterior	Area	Heated
2 Story	Basement	Siding	1,452 sq ft	2 Story
1 Story	Basement	Siding	450 sq ft	1 Story

Basement Finish

Recreation	0 sq ft	Recreation % Good	0%
Living Area	0 sq ft	Living Area % Good	0%
Walk Out Doors	1	No Concrete Floor Area	0 sq ft

Plumbing Information

3 Fixture Bath	3	2 Fixture Bath	1
Extra Sink	1	Separate Shower	1
Vent Fan	3		

Built-In Information

Cook Top	1	Dishwasher	1
Vented Hood	1	Oven	1
Microwave	1		

Fireplace Information

Prefab 1 Story	1
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Garage Information

Area	840 sq ft	Exterior	Siding
Foundation	42 Inch	Common Wall	1 Wall
Year Built	2017	Finished	Yes
Auto Doors	0	Mech Doors	2

Porch Information

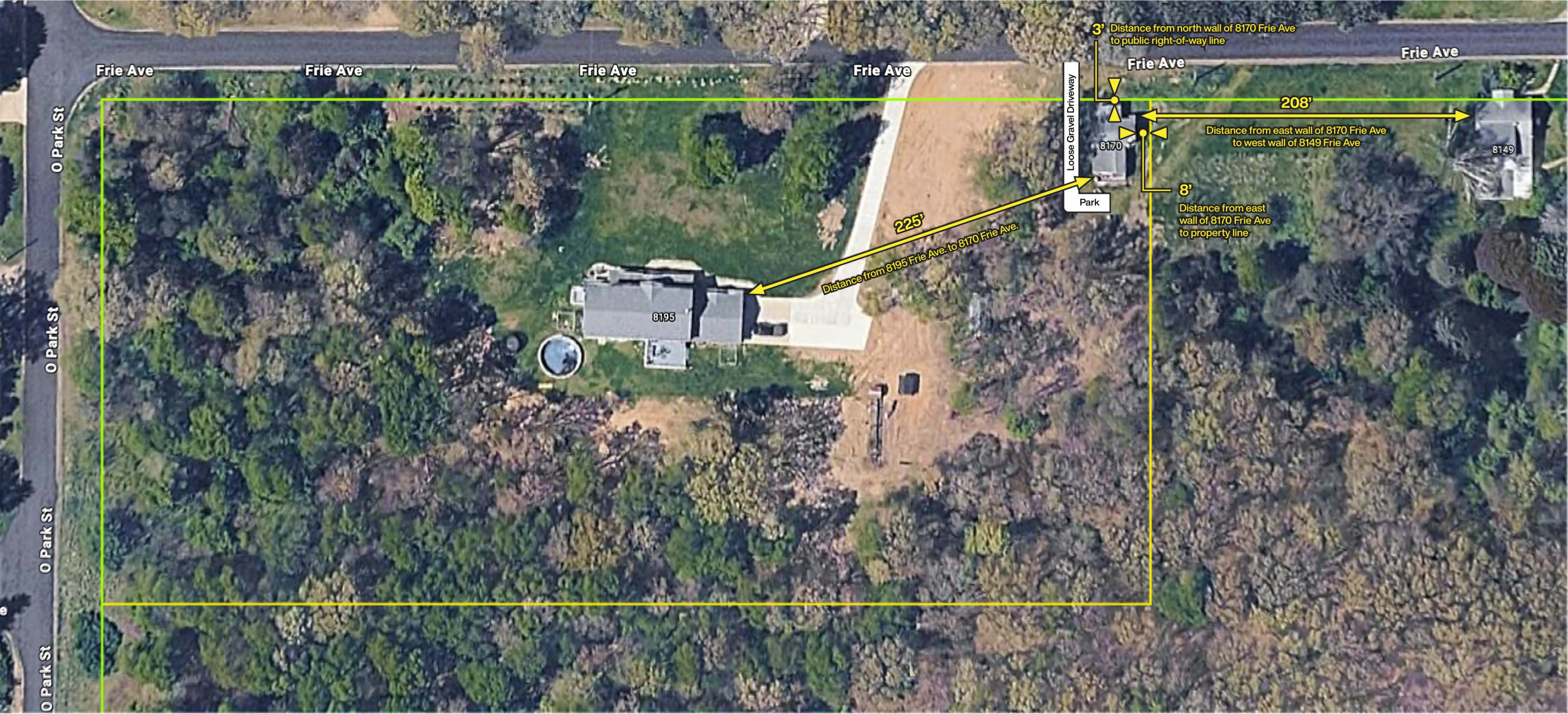
WCP (1 Story)	372 sq ft	Foundation	Standard
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Deck Information

Treated Wood	384 sq ft
Treated Wood	64 sq ft

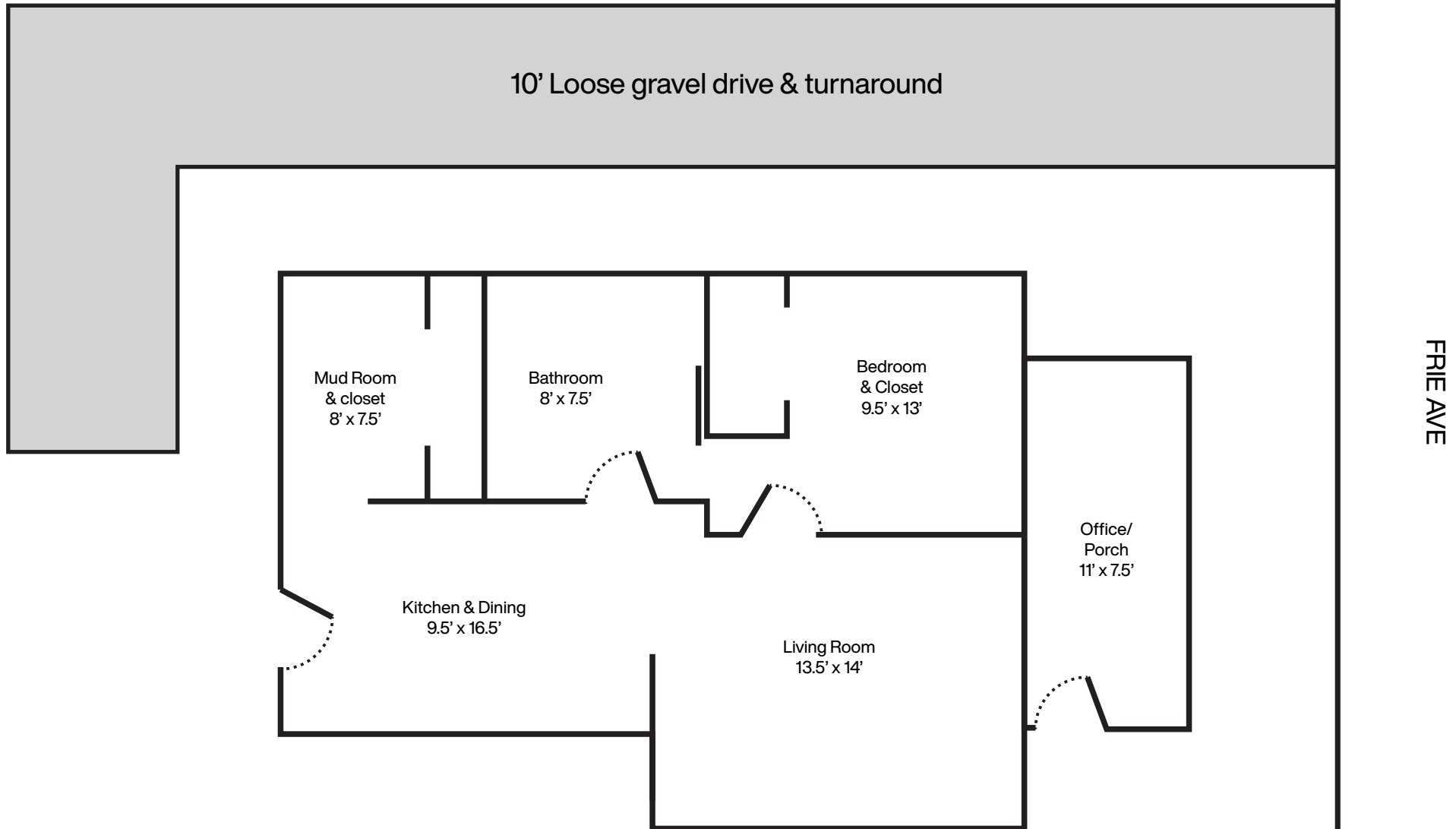
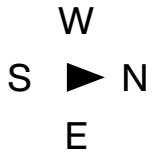
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8195 Frie Avenue

8170 Frie Avenue
Proposed ADU



Note: loose drawn / not to scale

Planning Commission: 10-8-26

Packet Page 25

Last Revised: 10-1-26



8170 Frie Ave. - South Face



8170 Frie Ave. - East Face

Note: the chimney/heat stack is not complete here. It will be extended up and enclosed per code regulation for height & clearance.



8170 Frie Ave. - West Face



8170 Frie Ave. - North Face



8195 Frie Ave. - North Face



8195 Frie Ave. - South Face



8195 Frie Ave. - East Face



8195 Frie Ave. - West Face

3m

RECEIVED
2017 NOV 29 AM 8:57
COUNTY OF KALAMAZOO

2017-039735 11/29/2017 09:03:23 AM
Pages: 1 of 3 REST
M CHARLES ETTER
Timothy A. Snow County Clerk/Register Kalamazoo County, MI

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DECLARATION OF RESTRICTION

Anthony M. Wickey and Jennifer K. Wickey, husband and wife, ("Declarants") whose address is 8170 Frie Avenue, Kalamazoo, Michigan 49009, being the sole owners of the property located in the Township of Oshtemo, County of Kalamazoo, and State of Michigan, and described on attached Exhibit A (The Property), hereby make the following declaration:

Only one structure located on The Property may be utilized as a dwelling unit at any one time. The term "dwelling unit" shall be as defined as follows:

Dwelling unit—A building designed for occupancy by one family for residential purposes and having cooking, sleeping, and sanitary facilities.

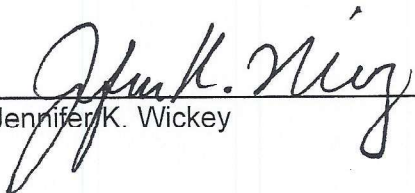
This restriction shall run with the land and shall be binding upon the heirs, successors and assigns of the undersigned.

Dated: November 28, 2017

Signed by:



Anthony M. Wickey

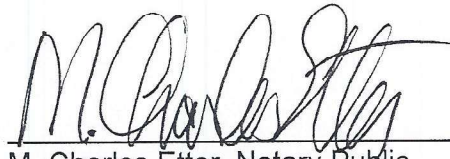


Jennifer K. Wickey

STATE OF MICHIGAN }
 }SS.
COUNTY OF KALAMAZOO }

The foregoing instrument was acknowledged before me this 28th day of November, 2017, by

Anthony M. Wickey and Jennifer K. Wickey, husband and wife.



M. Charles Etter, Notary Public
Kalamazoo County, Michigan
My commission expires: October 25, 2021

Drafted By And When Recorded Return To:
M. Charles Etter
M. Charles Etter, Attorney, P.C.
141 East Michigan Avenue
Suite 602
Kalamazoo, MI 49007
(269) 345-0158

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2017-039735 11/29/2017 09:03:23 AM
Pages: 2 of 3 REST
M CHARLES ETTER
Timothy A. Snow County Clerk/Register Kalamazoo County, MI



Exhibit A
To
Declaration Of Restriction

Legal Description: Lot 3, Block 1, FRIE & GIBBS, Oshtemo Township, Kalamazoo County, Michigan, according to the recorded plat thereof, recorded in Liber 8 of Plats, Page 19, Kalamazoo County Records

2017-039735 11/29/2017 09:03:23 AM
Pages: 3 of 3 REST
M CHARLES ETTER
Timothy A. Snow County Clerk/Register Kalamazoo County MI


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Memorandum



Date: October 8, 2026
To: Planning Commission
From: Jodi Stefforia, Planning Director
Subject: Resume Review - Draft One – Energy Systems Ordinance

Review of the first working draft of the Energy Systems Ordinance commenced on August 13 and continued on September 10. The review left off on Section 49.290.D.3.EE on page 33 of the draft. Review will resume on October 8. This month, we will begin reviewing Appendix A – Sound Report Requirements. The Sound Report Requirements are taken directly from the MPSC application requirements.

In response to PA 233, the draft ordinance is comprehensive and in the early sections addresses wind, solar, and energy storage systems with general parameters while *later sections* provide *specific requirements per energy type* as will the Appendices.

If the Energy Systems Ordinance is adopted, the existing Zoning Ordinance provisions for wind and solar will be repealed. This approach will allow renewable energy systems – both principal use systems and private accessory-scale systems – to be addressed in one ordinance section rather than in several sections scattered throughout the Zoning Ordinance.

Reminder - As we begin the substantial task of reviewing the draft language, please keep the following in mind:

- This is a working draft; edits will be made before it is finalized.
- We can take as many meetings as necessary to review the working draft, the Appendices, receive public comment, and consider suggested edits. Then we can start walking through changes in draft two.
- The Planning Commission does not need to become experts in every technical aspect of these systems. If an application for a principal use project is received, a significant escrow will be required as part of the application fee to retain subject matter experts to help establish the scope of studies to be completed by the applicant, assist with review of specific aspects of any proposed project and location, and provide other technical support as needed. This is standard practice.
- If the Planning Commission would like subject matter experts on specific elements of the ordinance or technologies to attend a meeting during the text review, please let staff know. Staff can then request Township Board approval of a budget amendment to retain those individuals.
- Additional Appendices will be included in a future meeting packet. Appendices B, C and D will address energy storage systems specifically. Appendix B will outline the specific

requirements for a Fire Response Plan which will be informed by a specific project and site. Appendix C establishes requirements for the Operation and Maintenance Manual. It is anticipated that Appendix D will provide specific requirements for a Social Impact Study.

- Although attention has thus far been focused on the west side of the community, the ordinance must consider the entire Township. The language should remain broad enough to apply Township-wide, recognizing that *project-specific studies* will be required if an application is received. Should an application be received, the scope of those studies would be based on the proposed project location and site-specific conditions.
- Staff used AI as a tool to help identify potential areas where the ordinance could be strengthened to better protect the community. Those AI-generated suggestions were then researched and reviewed for validity before being incorporated or considered.
- The Township has environmental protection ordinances addressing wetlands, steep slopes, clear cutting, groundwater and wellhead protection, and related topics in various sections of the General Ordinance and Zoning Ordinance. A separate effort is currently underway to strengthen and consolidate those provisions into a single area of the General Ordinance and, where appropriate, expand them Township-wide.
- After the Planning Commission has reviewed the text and received public comment, staff anticipate using a Planning Commission meeting to conduct a mapping exercise before commencing preparation of draft two.

Energy Systems – Draft One Zoning Ordinance Amendments (August 2026)

Note: *Create new Energy Systems Requirements for Special Uses Subsection in Ordinance including replacement of existing Section 60 and Section 49.290 to address utility scale energy storage, solar energy and wind energy systems. Add language for accessory private energy systems as Section 48.170. TBD - zoning districts in which to allow utility scale systems.*

Section 49.290 – Energy Systems.

The purpose of this section is to establish minimum requirements and regulations for the construction, erection, placement, location, maintenance, modification, operation, and decommissioning of principal use energy systems and private accessory energy systems in the Township in a manner that promotes economic development and ensures the protection of health, safety, and welfare of the public while also avoiding adverse impacts to important areas such as agricultural lands, residential areas, endangered species habitats, conservation lands, and other sensitive lands.

A. Definitions.

Battery Energy Storage System (BESS): An electrochemical device or assembly that stores energy and is capable of providing that energy to an electrical load. This includes all associated electric, mechanical and fire protection components.

Battery Management System (BMS): The electronic system that manages a rechargeable battery by monitoring its state, calculating secondary data, reporting, protecting the battery, and controlling its environment.

Central Station Monitoring: The monitoring of fire detection system signals by a listed central station service alarm system, as defined by NFPA 72, that receives alarms from the ESS site and provides timely notification to the fire department.

Emergency Operations Plan (EOP): A written plan, developed by the ESS owner or operator, that establishes procedures for ESS personnel to follow during emergency conditions, including safe shutdown, system isolation, and coordination with emergency responders. Required under NFPA 855 § 4.3.2.1.

Emergency Response Plan (ERP): A site-specific written plan satisfying NFPA 855 Annex G, developed in coordination with the Fire Chief that provides first responders with the information and procedures needed to safely manage an ESS incident, including thermal runaway, fire, explosion, and chemical release events. The ERP supplements the EOP and is directed specifically toward emergency responder operations.

Energy Storage System (ESS): A system that absorbs energy, stores it, and discharges it at a later time to provide electrical power or grid services. As used in this ordinance, ESS refers to stationary systems, inclusive of BESS. Energy storage system does not include fossil fuel storage or power-to-gas storage that directly uses fossil fuel inputs.

Energy storage systems are classified as follows:

1. *Energy Storage System, Private Accessory*: An Energy Storage System that is an accessory use that is intended to primarily serve the needs of the consumer on-site. For purposes of this ordinance, an ESS with a capacity greater than 200 kW is considered a principal use.
2. *Energy Storage System, Principal Use*: An Energy Storage System that is a principal use (or co-located with a second principal use) and that is designed and built primarily to connect to the transmission grid but may also serve another principal use(s).

Exposure: Any lot line, public way, building, structure, occupied space, stored combustible material, hazardous material, high-piled stock, or other condition that presents a fire, explosion, or life-safety hazard in proximity to an ESS.

Factory Acceptance Test (FAT): A verification process performed at the manufacturer's facility prior to shipment to confirm that the ESS meets specified performance, safety, and quality requirements.

Fire Mitigation Personnel / Hazard Support Personnel: Qualified personnel, designated by the ESS owner or operator, who possess knowledge of the specific ESS installation and its associated hazards, and who are available to be dispatched to support local emergency responders during an ESS incident.

Fire Response Plan (FRP): As used in this ordinance, Fire Response Plan encompasses both the Emergency Operations Plan (EOP) and the Emergency Response Plan (ERP), together forming the complete framework for ESS incident preparedness and response required by this Section.

IFC: International Fire Code

Leq: The equivalent average sound level for the measurement period.

MISO: The Midcontinent Independent System Operator.

MPSC: The Michigan Public Service Commission.

NFPA: The National Fire Protection Association.

NFPA 70: National Electrical Code.

NFPA 72: National Fire Alarm and Signaling Code.

NFPA 855: Standard for the Installation of Stationary Energy Storage Systems.

Network Operations Center (NOC): A centralized facility staffed by trained personnel with working knowledge of the ESS and site, responsible for 24/7 remote monitoring of the Battery Management System (BMS), alarm notifications, and immediate communication with the site owner/operator and, upon request, the fire department.

Non-Participating Property: Any property that is adjacent to a participating property.

Occupied Community Building: A public library, community center, or other similar building that the applicant knows or reasonably should know is used on a regular basis as a gathering place for

community members. See also Sensitive Land Use.

Participating Property: A solar energy system, energy storage system or wind energy system host property or any real property that is the subject of an agreement that provides for the payment of monetary compensation to the landowner from system owner (or affiliate) regardless of whether any part of a system is constructed on the property.

Prime Farmland: Land, as determined by the US Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic Database (SSURGO), that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest and, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding. Examples of soils that qualify as prime farmland are Palouse silt loam, 0 to 7 percent slopes; Brookston silty clay loam, drained; and Tama silty clay loam, 0 to 5 percent slopes.

Remote Outdoor Installation: An ESS installed outdoors and located not less than one hundred feet (100 ft) from all buildings, lot lines, public ways, stored combustible materials, hazardous materials, high-piled stock, and other exposure hazards, as defined in IFC § 1207.8.1.

Site Acceptance Test (SAT): a verification process performed at the installation site following commissioning to confirm the ESS operates correctly in its final installed configuration.

Sensitive Land Uses: A use or facility where exposure to SES or ESS related hazards would pose heightened risk, including but not limited to residences, schools, licensed childcare facilities, hospitals, nursing homes, and places of assembly. See also Occupied Community Building.

Solar Energy System (SES): A system that captures and converts solar energy into electricity, for the purpose of sale or for use in locations other than solely the solar energy system property. A solar energy system includes, but is not limited to, the following equipment and facilities to be constructed by an electric provider or independent power producer: photovoltaic solar panels; solar inverters; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers; poles; crossarms; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; energy storage systems; overhead and underground control; communications and radio relay systems and telecommunications equipment; utility lines and installations; generation tie lines; solar monitoring stations; and accessory equipment and structures.

Solar Energy Systems are classified as follows:

1. **Solar Energy System, Private Accessory:** A solar energy system with a building-mounted and/or ground-mounted collector array and related apparatus intended to generate electricity only for the premises on which the system is located and in some instances, on neighboring premises, and not primarily for connection to a public utility power grid;

provided, this term is not intended to include a solar energy collector device not exceeding 5 square feet in area.

2. *Solar Energy System, Principal Use:* A Solar Energy System with a name plate capacity of more than 2 megawatts for the primary purpose of off-site use through the electrical grid or export to the wholesale market.

Specialty Crop Farm: Land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables. (Definition is adopted from the USDA definition of "Unique Farmland.")

Thermal Runaway: An exothermic chain reaction within a battery cell in which self-heating causes a cell to reach a condition of uncontrolled, self-sustaining temperature increase, which can propagate to adjacent cells and lead to fire, explosion, or release of toxic gases.

Thermal Propagation: The spread of thermal runaway from one cell to adjacent cells, modules, or enclosures within the same ESS.

UL9540: Underwriters Laboratories Standard for Energy Storage Systems and Equipment.

UL9540A: Underwriters Laboratories Standard for Safety for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.

Wind Energy System (WES): A system that captures and converts wind into electricity for the purpose of sale or for use in locations other than solely the wind energy system property. Wind energy system includes, but is not limited to, the following equipment and facilities to be constructed by an electric provider or independent power producer: wind towers; wind turbines; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers; poles; crossarms; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; energy storage systems; overhead and underground control; communications and radio relay systems and telecommunications equipment; monitoring and recording equipment and facilities; erosion control facilities; utility lines and installations; generation tie lines; ancillary buildings; wind monitoring stations; and accessory equipment and structures.

Wind Energy Systems are classified as follows:

1. *Wind Energy System, Private Accessory:* A Wind Energy Storage System that is an accessory use that is intended to primarily serve the needs of the consumer on-site.
2. *Wind Energy System, Principal Use:* A Wind Energy System for the primary purpose of off-site use through the electrical grid or export to the wholesale market.

B. General Provisions. Principal Use Energy System.

The application for approval of a principal use energy system shall be made according to the procedure for Special Uses set forth in Section 65.40 and the application guidelines set forth in this section. Any application for a Principal Use Energy System shall contain all of the following. Each item listed below shall be provided as an Exhibit and numbered to correspond with the subsection it addresses. An incomplete application will not be accepted.

1. The complete name, mailing address, email address, and telephone number of the applicant and property owner(s).
2. The planned date for the start of construction and the expected duration of construction.
3. The submission shall include content responsive to all of the following, to the extent not otherwise provided pursuant to the below referenced sections:
 - a. A description of the energy system, including a site plan as described in Section 64 of this Ordinance and this Section. All information and supporting materials relied upon by the applicant to demonstrate compliance with the site plan approval standards as specified in this Ordinance shall be provided.
 1. Site Selection. This land use shall not unreasonably diminish farmland, including, but not limited to, prime farmland and, to the extent that evidence of such farmland is available in the evidentiary record, farmland dedicated to the cultivation of specialty crops.
 2. A map of all properties upon which any component of a facility or ancillary feature would be located showing current land use, tax identification number and owner of record of each property. Identify any parcels within the facility boundaries participating in farmland development rights agreements Michigan's Farmland and Open Space Preservation Program (PA 116). Additionally, for wind energy systems, all properties within two thousand (2,000) feet of such properties, and for solar energy or energy storage systems, all properties within one thousand (1,000) feet. This should indicate the location of all existing structures and shall identify such structures as occupied or vacant and their use if occupied. This should also include the identification of land being used for agriculture including the cultivation of specialty crops according to publicly available data.
 3. Lot lines and required setbacks shown and dimensioned.
 4. Size and location of existing and proposed water utilities, including any proposed connections to public or private sewer or water supply systems.
 5. A map of any existing overhead and underground major facilities for electric, gas, and telecommunications transmission within the facility and surrounding area.
 6. The location and size of any existing or proposed substations or energy storage facilities accessory to the principal use.
 7. Staging areas and lay-down yards.

8. The location and size of all surface water drainage facilities, including source, volume expected, route, and course to final destination'.
 9. Designated groundwater management zones, designated agricultural districts and flood-prone areas.
 10. For solar energy and energy storage systems, depth of groundwater at the facility and within 1,000 feet of the perimeter fence.
 11. Recreational and other land uses that might be affected by the sight or sound of the construction or operation of the facility, interconnections and related facilities. Identify any wildlife or scenic corridors, open spaces, known archaeological, geologic, historical, or scenic areas, parks, designated wilderness, forest lands, specialty farms, scenic vistas, conservation easements, wetlands, federal or state designated scenic byways, nature preserves, wildlife sanctuaries, designated trails, major communication and utility uses and infrastructure, and institutional, community, and municipal uses and facilities within one mile of the property line.
 12. A map depicting the proposed facilities, adjacent properties, all structures within participating and adjacent properties, property lines, municipal boundaries, and the projected sound isolines along with the modeled sound isolines including the ordinance limit. See also Exhibit A for specific Sound Report Requirements.
 13. For wind energy systems, a map or schematic showing the area including sensitive receptors that will be impacted by shadow flicker for wind facilities, including isolines indicating areas expected to experience 30 hours or more per year of shadow flicker.
- b. A description of the expected use of the energy system.
 - c. A description of the expected public benefits of the proposed energy system.
 - d. A Phase I and, if warranted by the findings of Phase I, a Phase II Environmental Site Assessment including records of consultation with relevant state, tribal, and federal agencies.
 - e. A qualitative assessment of the compatibility of the facility, including off-site staging and storage areas, with the Go! Green Oshtemo and 2045 Oshtemo Comprehensive Plan including the expected direct and indirect impacts of the proposed energy system on the conservation of the environment, agricultural lands, historic resources, recreational resources, and natural resources including wildlife and/or scenic corridors and how the applicant intends to address and mitigate these impacts. The assessment shall identify the nearby land uses and shall address the land use impacts of the facility on residential areas, schools, specialty crop farms, civic facilities, recreational areas and commercial areas. The scope of such assessment shall be established by the Township's subject matter expert. The assessment and evaluation shall demonstrate to the Planning Commission's satisfaction that conflicts from facility-generated noise, dust, traffic, and visual impacts with current and planned uses have been minimized to the extent practicable.
 - f. A qualitative assessment on the effects of the proposed energy system on the social well-being, equity, health and safety of residents within one mile of the site prepared by a third-party licensed professional with experience with the social impacts of the proposed facility

type. The scope of such assessment shall be established by the Township's subject matter expert.

- g. A description of the portion of the community where the energy system will be located.
- h. A statement and reasonable evidence that the proposed energy system will not commence commercial operation until it complies with applicable state and federal environmental laws, including, but not limited to, the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
- i. Evidence of consultation of the proposed system as presented to the Township, before submission of the application, with the following county, state and federal agencies before submitting the application, including:
 - 1. Federal agencies – where applicable.
 - 2. Michigan Department of Natural Resources.
 - 3. State Historic Preservation Office.
 - 4. Michigan Department of Environment, Great Lakes, and Energy.
 - 5. Michigan Department of Agriculture and Rural Development.
 - 6. Kalamazoo County Drain Commission.
 - 7. Kalamazoo County Health & Community Services, Environmental Health Division.
 - 8. Road Commission of Kalamazoo County.
 - 9. Michigan Department of Transportation – Aeronautics Commission and Kalamazoo Transportation Service Center.
 - 10. Owners of major facilities for electric, gas, and telecommunications lines.
- j. The Soil and Economic Survey Report under Section 60303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.60303, for Kalamazoo County, and when the property is within 1,000 feet of Van Kal Street, Van Buren County.
- k. MISO Interconnection queue and power transmission information. Execution of a generator interconnection agreement must be anticipated within 12 months of application for special use approval due to time limits imposed in Section 65.60. The following power transmission and interconnection information is required:
 - 1. Queue number or other information providing the ability to identify the proposed facility within the interconnection queue.
 - 2. Copies of all studies completed by the regional transmission organization including feasibility studies and system impact studies.
 - 2.1. If a generator interconnection agreement has been executed, the executed generator interconnection agreement may be submitted in lieu of the studies.

- 2.2. The generator interconnection agreement and/or studies may be filed subject to a protective order and non-disclosure agreement.
- l. If the energy system is reasonably expected to have an impact on television signals, microwave signals, agricultural global position systems, military defense radar, radio reception, or weather and doppler radio, a plan to minimize and mitigate that impact. Information in the plan concerning military defense radar is exempt from disclosure under the Freedom of Information Act, 1976 PA 442, MCL 15.231 to 15.246, and shall not be disclosed by the Township or the electric provider or independent power producer except pursuant to court order. Wind energy systems should provide evidence of prior consultation with nearby communication tower operators, including those of the United States Department of Defense.
 - m. A stormwater management plan pursuant to Article 161.
 - n. For solar energy and energy storage systems, a Groundwater Contamination Risk Assessment and Spill Contingency Plan satisfying Article 162, Groundwater and Wellhead Protection.
 - o. Fire Response Plan. In addition to the more specific provisions of Section D.3.R for an energy storage system, for all energy systems, a Fire Response Plan (FRP) shall include the following:
 1. Evidence of consultation with the Oshtemo Township Fire Chief to ensure that the FRP is in alignment with acceptable operating procedures, capabilities, resources, etc.
 2. A description of all on-site equipment and systems to be provided to prevent or handle fire emergencies.
 3. A description of all contingency plans to be implemented in response to the occurrence of a fire emergency.
 4. For wind and solar projects, a commitment to conduct, or provide funding to conduct, site-specific training drills with emergency responders before commencing operation, and upon request while the facility is in operation. Training should familiarize local fire departments with the project, hazards, procedures, and current best practices.
 5. For energy storage projects, a commitment to review and update the FRP at least annually with the Oshtemo Township Fire Department, first responders, and Kalamazoo County Emergency Manager (including Van Buren County for projects located within one mile of the border between Kalamazoo County and Van Buren County).
 6. A commitment to offer to conduct, or provide funding to conduct, full-scale site-specific training drills with emergency responders before commencing operation, and at least once per year while the facility is in operation. Training should familiarize Oshtemo Township Fire Department and other local fire departments and emergency responders with the project, hazards, procedures, and current best practices.
 7. An analysis of whether plans to be implemented in response to a fire emergency can be fulfilled by existing local emergency response capacity. The analysis should include identification of any specific equipment or training deficiencies in local emergency response capacity and recommendations for measures to mitigate deficiencies.
 8. A 24-hour emergency contact telephone number for use by emergency services providers.
 9. The FRP must meet all requirements of the Clean and Renewable Energy and Energy Waste Reduction Act, as amended, MCL 460.1001 et. seq
 10. Other information the applicants find relevant.

Changes to the design, type, manufacturer, etc. of facilities or equipment after the initial filing must be analyzed to determine if changes are necessary to the FRP. Additional consultation with the Oshtemo Township Fire Department, first responders, and Kalamazoo County emergency managers is required for amended plans.

- p. Emergency Response Plan. In addition to the more specific provisions of Section D.3.Q for an ESS, an Emergency Response Plan (ERP) shall include the following:

1. Evidence of consultation with the Oshtemo Township Fire Chief and Kalamazoo County Emergency Manager to ensure that the ERP is in alignment with acceptable operating procedures, capabilities, resources, site accessibility, etc.
2. An identification of contingencies that would constitute a safety or security emergency (fire emergencies are to be addressed in a separate Fire Response Plan (FRP)).
3. Emergency response measures by contingency.
4. Evacuation control measures by contingency.
5. Community notification procedures by contingency including mass emergency notification systems pursuant to NFPA 72.
6. An identification of potential approach and departure routes to and from the facility site for police, fire, ambulance, and other emergency vehicles.
7. A commitment to review and update the ERP with fire departments, first responders, and county emergency managers at least once every 3 years.
8. An analysis of whether plans to be implemented in response to an emergency can be fulfilled by existing local emergency response capacity, and identification of any specific equipment or training deficiencies in local emergency response capacity.
9. The means by which firefighters and other emergency services personnel can access and shut down the system on an emergency basis. This information shall be provided to the Township or other appropriate agency managing emergency response.
10. A 24-hour emergency contact telephone number for use by emergency services providers.
11. Other information the applicant finds relevant.

Changes to the design, type, manufacturer, etc. of facilities or equipment after the initial filing must be analyzed to determine if changes are necessary to the ERP. Additional consultation with the Oshtemo Township Fire Department, first responders, and Kalamazoo County Emergency Manager is required for amended plans.

- q. A decommissioning plan that includes the following:

1. An overview of the proposed energy facility including:
 - 1.1. A detailed description of the proposed energy facility above ground and overview of the current land use of the site where the proposed energy facility will be located.
 - 1.2. The expected useful life of the proposed energy facility.
 - 1.3. A description of events which would trigger owner-initiated decommissioning.
 - 1.4. A physical and chemical analysis of the soil at the time of development which will be used to ensure soil is returned to a useful condition. Prior to conducting the analysis, the scope of the assessment, including the sampling methodology, number and location of samples, and analytical parameters,

- shall be established by the developer and approved by the Township Engineer or his/her designated subject matter expert.
- 1.5. A list of known hazardous substances at the time of development.
 2. A description of the energy facility removal process including:
 - 2.1. A proposed decommissioning schedule.
 - 2.2. A description of facilities that will be removed and those that will be kept in place including the reasoning and agreement with the property owner.
 - 2.3. A description of removal methods and site clearance activities.
 - 2.4. A description of anticipated hazardous substances used in the facility and removal from the site based upon what is known at the time the application is filed.
 - 2.5. A description of planned materials management methods and transportation plans and an initial plan as to whether components will be sold, landfilled, recycled, or other, with the understanding that such plans will be updated periodically.
 - 2.6. A description of resources, conditions, or activities potentially affected by decommissioning and mitigation measures to be employed during the decommissioning process.
 3. A description of the site restoration plan that returns the site to a useful condition similar to its pre-construction state. Process milestones and PA 116 restoration requirements should be detailed, including necessary steps to ensure soil is returned to at least as good or better condition with respect to organic matter, infiltration, compaction, drainage and crop productivity.
 4. A list of expected necessary permits for demolition or new temporary construction which may be required for component removal and a statement that such permits will be obtained prior to the start date of decommissioning.
 5. Details describing the financial assurance:
 - 5.1. The type and manner of financial assurance the developer plans to provide (cash is prohibited), subject to the terms of any future Township approval and Township-approved decommissioning agreement:
 - 5.1.1. Bond.
 - 5.1.2. Irrevocable letter of credit, excluding cash.
 - 5.2. Such financial assurance shall be expressly held for the benefit of the Township.
 - 5.3. The Township must be notified in writing at least 60 days before the financial assurance is set to expire. Failure to provide proper notification and updated financial assurance information is a violation of this ordinance.
 6. The following commitments and assurances shall be included in the decommissioning plan:
 - 6.1. A commitment to provide decommissioning plan and financial assurance cost updates every 3 years.
 - 6.2. An assurance statement that restoration will be in accordance with agreements with landowners.

- 6.3. A commitment and plan to coordinate with landowners and the Township prior to beginning decommissioning activities.
 - 6.4. An assurance that decommissioning plan updates and cost estimates shall be filed with the Township Clerk.
 - 6.5. An assurance that the financial assurance shall be updated according to the required periodic decommission plan and cost estimate updates and maintained throughout the operational life of the facility.
 - 6.6. Assurance that the owner will provide annual proof to the Township Clerk that the financial assurance remains sufficient and in effect.
 - 6.7. A statement agreeing to provide a decommissioning completion report to the Township within 60 days after decommissioning is complete.
7. The decommissioning plan shall include a Decommissioning Agreement that shall be executed and recorded at the Kalamazoo County Register of Deeds. The Decommissioning Agreement shall be executed and recorded upon issuance of a building permit or if a building permit is not required, within seven (7) days prior to commencement of construction. A draft of the proposed Decommissioning Agreement shall be provided to the Township Clerk within 30 days of special use approval for Township Attorney review and approval. The Decommissioning Agreement shall follow a template available from the Township Clerk.
 8. The decommissioning cost estimate shall include a detailed cost estimate for restoration of participating properties to useful condition similar to that which existed before construction, repair of drainage systems and damaged roads. It shall also include removal of above-surface facilities, foundations to a depth of four feet and infrastructure that have no ongoing purpose. The estimate must include the following:
 - 8.1. Detailed cost estimates for removal of energy facility equipment and infrastructure, land restoration and reclamation, groundwater and soil remediation, hazardous waste disposal, and liability insurance requirements calculated by a third party with expertise in decommissioning to restore to useful condition similar to before the energy facility.
 - 8.2. An estimate of salvage value for energy facility equipment and infrastructure calculated by a third party licensed professional engineer with expertise in decommissioning.
 - 8.3. An estimate of the cost to hire a decommissioning consultant to manage the decommissioning process in the event of owner abandonment or bankruptcy.
- r. A preconstruction sound report, satisfying Appendix A, detailing the sound modeling results along with mitigation plans to ensure that sound emitted from the facilities will remain below ordinance limits throughout the operational life of the facility. Post-construction sound monitoring protocol is required as part of the preconstruction sound report and shall satisfy Appendix A.
 - s. For solar energy systems and energy storage systems, a visual impact assessment prepared by a third party qualified professional of the visual impacts of the proposed project including a description of the project, the existing visual landscape, and important scenic resources, plus visual simulations that show what the project will look like including

proposed screening and landscaping, a description of potential project impacts and mitigation measures that would help reduce the visual impacts created by the project.

- t. For solar energy systems and energy storage systems, a photometric plan to demonstrate compliance with dark sky-friendly lighting solutions.
- u. For wind energy systems, light-mitigation plans, including exemptions requested for during the construction period.
- v. For wind energy systems, a report detailing the flicker modeling results with mitigation plans to ensure that flicker will remain below the limit listed in Section D.2.E throughout the operational life of the facility. The report must be prepared by a qualified third party using the most current modeling software available and be based on real world or adjusted case assessment modeling. The report must show the locations and estimated amount of shadow flicker to be experienced at all occupied community buildings and non-participating residences as a result of the individual turbines in the system.
- w. A Community Host Agreement in the amount of \$5,000 per megawatt of nameplate capacity which shall be executed prior to commercial operation of the system.
- x. A Property Tax Guarantee for consideration by the Township Board upon special use approval, if granted, by the Planning Commission.
- y. Installation and Operational Safety. The system shall comply with all of the following requirements:
 - 1. The energy system shall be designed and constructed for interconnection to a Michigan Public Service Commission or Midcontinent Independent System Operator regulated utility electrical power grid and shall be operated with such interconnection.
 - 2. The energy system and all foundation elements shall comply with all applicable building and electrical code requirements, and any applicable federal/state regulations. The manufacturer's engineer or another qualified engineer shall provide written certification that the design, installation (including foundations), and interconnection is compliant with the manufacturer and industry standards, all applicable local construction and electrical codes, and any applicable federal/state regulations.
 - 3. Other than transmission or distribution lines for interconnection to the electric power grid, all electrical wiring shall be buried underground; except where the manufacturer's engineer or a qualified engineer employed by the utility that owns/operates the electrical power grid to which the energy system shall be interconnected certifies an underground wiring installation is not permitted by an applicable code and/or applicable federal/state regulation, with attached complete documentation supporting any such certification.
- z. A plan for third party monitoring of the energy system with at least once weekly site visits while the system is being constructed and shall continue until all approvals have been issued by the appropriate regulating authorities. The independent third party monitor shall resolve complaints and request immediate cessation of activities that the

monitor can document are in material breach of any plan, permit or agreement pertaining to the construction of the facility. The independent third party monitor shall provide periodic reports to the Planning Commission and the applicant from the start of construction and continuing through the first 3 months of commercial operation. The cadence of the reports will be determined by the independent monitor in consultation with the Planning Commission.

- aa. Through the special use process, the Planning Commission shall require reasonable measures to minimize visual impacts by preserving existing natural vegetation, requiring new vegetative screening or other appropriate measures. The Planning Commission shall determine such required visual screening measures on a site-specific basis pursuant to the landscaping standards of Section 53 and/or the standards for site plan approval as specified in Section 64 of this Ordinance, as most applicable to the circumstances. In making this determination the Planning Commission is specifically authorized to consider whether additional visual screening measures are appropriate where a system is proposed to be located on property adjoining a residential property.
- bb. If the system includes an access drive(s) for maintenance purposes, the surface of the access drive(s) shall be permeable but still support the live load of a fire apparatus, unless on brownfield land or on an already paved surface at the time of application for approval such as a parking lot or former building foundation.
- cc. Except as otherwise depicted on and approved with the site plan, the area within which the system is located shall not be paved with asphalt/concrete or any other surface material that is impermeable to water other than for slab foundations for structures and equipment. This shall not apply to a system located on brownfield land or on an existing paved area such as a former building slab or in an unused parking area where adequate parking remains for any other use on the site.
- dd. No outdoor storage of parts, inoperable equipment, junk or blight is permitted at the facility. The grounds shall be kept in a manner compatible with the character of the area within which the facility is located.
- ee. Non-motorized facilities shall be provided pursuant to the adopted Non-Motorized Facilities Map.
- ff. Construction Information: Describe the project's proposed construction and installation methods including:
 - 1. Soil surveying and testing plans, pursuant to Natural Resources and Environmental Protection Act (NREPA).
 - 2. Grading and excavation.
 - 3. Construction of temporary and permanent access roads, staging areas, laydown areas and trenches.
 - 4. Stringing of cable and/or laying of pipe.
 - 5. Installation of electric transmission line poles and structures, including foundations.
 - 6. Depth of underground infrastructure; must be at least four feet unless a lesser depth is approved by the Planning Commission.
 - 7. Post-construction restoration.
 - 8. Maps showing the following:
 - 8.1. The planned routes (may be preliminary) for cranes and other heavy equipment.

- 8.2. The location of any existing deeded easement granted to any entity within the footprint of the facility.
 - 8.3. The location of known existing and proposed county and intercounty drains, drain easements, and underground drainage tiles including data provided by the Kalamazoo County Drain Commissioner or the property owner as applicable and to the extent available.
- jj. Unanticipated Discoveries Plan. An Unanticipated Discoveries Plan (UDP) that addresses the anticipated impacts and plans to mitigate impacts to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks, historic and cultural sites, and threatened or endangered species. If a sensitive habitat is identified, the Planning Commission shall require an impact evaluation. The UDP must include the following:
1. A set of procedures to be followed if cultural resources are discovered. Examples of cultural materials include, but are not limited to, the following:
 - 1.1. An accumulation of shell, burned rocks, or other food-related materials.
 - 1.2. Bones or small pieces of bone.
 - 1.3. An area of charcoal or very dark stained soil with artifacts.
 - 1.4. Stone tools or waste flakes (i.e., an arrowhead, or stone chips).
 - 1.5. Clusters of tin cans or bottles.
 - 1.6. Logging or agricultural equipment that appears to be older than 50 years
 - 1.7. Buried railroad tracks, decking, or other industrial materials.
 2. A set of procedures to be followed if human remains are discovered.
 3. A contact list that includes the following:
 - 3.1. Contact for the State Historic Preservation Office
 - 3.2. Contacts for Tribal Historic Preservation Offices of Michigan
 - 3.3. Local, project-specific, emergency contacts (i.e., Kalamazoo County Sheriff, Kalamazoo County Medical Examiner.)

C. Post Approval Requirements and Information

1. Completion Report. Before commencing commercial operations, the applicant shall file a Completion Report with the Township Clerk certifying compliance with PA 233, this Section, Appendices, as well as any conditions imposed by the Planning Commission in granting approval. At a minimum, the Completion Report should include the following:
 - a. Finalized site plans, finalized schematics, and dimensioned drawings.
 - b. Descriptions demonstrating compliance with Section 49.290.B and 49.290.D for the relevant technologies included within the facility.
 - c. A list and copy of all permits received including the permitting agency, the date the permit was received, and conditions attached to each permit.
 - d. Mechanical Completion Certificates.

- e. Submit a Postconstruction Sound Monitoring Report, satisfying Appendix A as part of the required Completion Report. A sound monitoring report shall be submitted within 60 calendar days of end of the field data collection.
- f. Conformity to approved plan. Sealed as-built survey and record construction drawings are required pursuant to Section 64.90.
- g. Contents of Annual Report filed with the Township Clerk no later than March 31 each year shall include the following:
 - 1. The facility name address and parcel number.
 - 2. The special use approval date.
 - 3. The reporting period covered by the report.
 - 4. The name, contact information, and role of the owner and operator submitting the report.
 - 5. The amount of electricity produced per turbine or per parcel.
 - 6. Complaints received during the time period as well as the developer/operators' response including resolution and/or plans for mitigation.
 - 7. Outline of the operating conditions and performance of the facilities on the site including non-producing ancillary equipment, structures, fencing, locks, gates, screening, and vegetative ground cover.
 - 8. List of any failures of equipment or structures that took place during the period as well as repairs that have been made during the time period or are planned or underway.
 - 9. All material improvements made to the site or facilities during the period as well as any planned improvements or planned changes to the site or facilities including changes to fencing or ancillary equipment during the reporting period.

The Township retains the right to perform on-site inspections annually to coincide with receipt of the Annual Report.

- h. Ownership and operator changes. For solar energy systems and energy storage systems, if the owner of the system changes or the owner of the property changes, the special land use approval shall remain in effect, provided that the successor owner or operator of the system assumes in writing all of the obligations of the special land use approval, site plan approval and decommissioning plan. A new owner or operator of the system shall notify the Township Clerk in writing of such change in ownership or operator within 30 days of the change.
- i. Approval timeframe and abandonment. The special land use and site plan approval shall be valid for a period of 24 months provided that a building permit is issued for construction and construction is commenced. In the event that construction is not completed in accordance with the final site plan, as may have been amended and approved by the Planning Commission, within 24 months after approval, the Planning Commission may extend time to complete construction for 12 months. If the owner and/or operator fails to perform substantial construction after 36 months, the approvals shall expire.

The system shall be considered abandoned when it ceases to operate consistently for more than one year. If the owner and/or operator fails to comply with decommissioning upon any abandonment, the Township may, at its discretion, enter the property and utilize the financial assurance for the removal of the system and restoration of the site in accordance with the decommissioning plan.

2. Complaint Resolution process as approved by the Planning Commission as a condition of approval must be established that includes the name(s) of a designated developer/operator representative provided with the authority to resolve complaints, a requirement that complaints are acknowledged within 2 business days, investigated within 5 business days and corrected within 30 days, a dedicated phone number and email address for complaints, and website information instructing the public on the complaint resolution process. Both construction and post-construction complaint resolution shall be addressed.
3. Battery Module or Array Replacement. For solar energy systems and energy storage systems, any battery module or array replacement shall be properly managed pursuant to the removal process identified in the Decommissioning Plan. Replaced components shall not be stored at the facility.

D. Specific Provisions: Principal Use Energy Systems.

The following requirements shall apply to all Principal Use Solar Energy Systems, Principal Use Energy Storage Systems and Principal Use Wind Energy Systems:

1. **Solar Energy System, Principal use:** A principal use solar energy system (SES), where permitted, is subject to special land use approval by the Planning Commission and/or other applicable authority, and shall meet the following requirements:
 - A. Height: Total height for a principal use SES shall not exceed a maximum of 16 feet above the natural grade of the ground beneath when the arrays are at maximum tilt.
 - B. Setbacks: Setback distance shall be measured from the stated location below to the nearest edge of the perimeter fencing of the principal use SES as follows:
 1. 500 feet from the nearest point on the outer wall of any occupied community buildings and residences on non-participating properties.
 2. 100 feet from the nearest edge of a public road right-of way.
 3. 100 feet from the nearest shared property line of non-participating parties.
 - C. A Groundcover and Vegetation Establishment and Management Plan shall be provided as part of the site plan. It shall provide for establishing and maintaining a vegetative ground cover over all areas of the property not used for access drives and foundations for the life of the facility, all required vegetation shall be annually inspected and properly maintained and replaced if dying and/or diseased and invasive species removed.

It shall meet or exceed pollinator standards throughout the lifetime of the facility, as established by the "Michigan Pollinator Habitat Planning Scorecard for Solar Sites" developed by the Michigan State University Department of Entomology or any applicable successor standards approved by the Planning Commission as reasonable and consistent with the purposes of this section. Seed mix used to establish pollinator plantings shall not include invasive species as identified by the Midwest Invasive Species Information Network, led by researchers at the Michigan State University Department of Entomology.

This section does not apply to an application for a facility that is proposed to be located entirely on brownfield land.

- D. Agricultural Protection: For sites where agriculture is the established land use, a principal use SES should be sited to minimize impacts to agricultural production through site design and accommodations including:
1. The ground mounting of panels by screw, piling, or a similar system that does not require a footing, concrete, or other permanent mounting in order to minimize soil compaction; and/or
 2. Siting panels to avoid disturbance and compaction of farmland by siting panels along field edges and in nonproduction areas to the maximum extent practicable and financially feasible; and/or
 3. Maintaining all drainage infrastructure on site, including drain tile and ditches, during the operation of the SES; and/or
 4. Siting the SES to avoid isolating areas of the farm operation such that they are no longer viable or efficient for agricultural production, including, but not limited to, restricting the movement of agricultural vehicles/equipment for planting, cultivation, and harvesting of crops, and creating negative impacts on support infrastructure such as irrigation systems or drains.
- E. Fencing: A principal use SES shall be secured with perimeter fencing to restrict unauthorized access. Perimeter fencing shall comply with the latest version of the National Electric Code as of November 2023 or any applicable successor standard as reasonable and consistent with the purposes of Subsection 226(8) of the Clean and Renewable Energy Waste Reduction Act, 2008 PA 295, MCL 460.1226.
- F. Lighting: A principal use SES shall comply with Section 54.
- G. Sound: The sound pressure level of a principal use SES and all ancillary solar equipment shall not exceed 30 dBA (Leq (1-hour)) at the nearest point on the shared property line of an adjacent non-participating residential property. Decibel modeling shall use the A-weighted sound level meter as designed by the American National Standards Institute.
- H. The collector panels and all other components of the system not within a fully enclosed building shall comply with all of the following at all times:
1. Designed and maintained with an anti-reflective surface material or coating;
 2. Designed and operated so as to not direct glare onto any adjoining property or any public road or other public way. This requirement applies whether collector panels are stationary or in a tracking array.
 3. An analysis from a third party qualified professional to determine if glare from the solar panels will be visible from Newman's Airport, residences and roadways shall be provided. The analysis shall consider the changing position of the sun throughout the day and year.

- I. A principal use SES shall not display lettering, company insignia, advertising, or graphics of any kind on any part of the system, except such non-obtrusive lettering and/or insignia intended to identify the manufacturer, which shall not be visible from any adjoining property or adjoining public road or other public way. Additional signage may be permitted subject to the requirements of Section 55.
 - J. A principal use SES shall be properly maintained in accordance with the manufacturer's recommendations and so as to be operable as designed as evidenced by a maintenance plan and schedule submitted with the application. If the maintenance procedures include the use of detergents or other non-organic substances to clean the solar collector panels and/or any other apparatus, the intended use of such products shall be disclosed in the application, with appropriate details on the type of product, the frequency and quantity of use, and the soil/water quality protection measures to be utilized as part of the maintenance plan. Any such soil/water quality protection measures shall also be included in a stormwater management plan submitted as part of the application and shown on the site plan.
 - K. Michigan Public Service Commission requirements: Principal use SES shall comply with any more stringent requirements adopted by the MPSC as provided in MCL 460.1226(8)(a)(vi).
2. **Wind Energy System, Principal use:** A principal use wind energy system (WES), where permitted, is subject to special land use approval by the Planning Commission and/or other applicable authority, and shall meet the following requirements:
- A. Setbacks: Setback distance shall be measured from the stated location below to the center of the base of the wind tower as follows:
 - 1. Occupied community buildings and residences on non-participating properties: A horizontal distance equal to 2.1 times the maximum blade tip height from the nearest point on the outside wall of the structure.
 - 2. Residences and other structures on participating properties: A horizontal distance equal to 1.1 times the maximum blade tip height from the nearest point on the outside wall of the structure.
 - 3. Non-participating property lines: A horizontal distance equal to 1.1 times the maximum blade tip height from the property line;
 - 4. Public road right-of-way: A horizontal distance equal to 1.1 times the maximum blade tip height from the center line of the public road right-of-way;
 - 5. Overhead communication and electric transmission, not including utility service lines to individual houses or accessory buildings: A horizontal distance equal to 1.1 times the maximum blade tip height from the center line of the easement containing the overhead line.

- B. Height: Total height, measured at the wind tower blade tip, for a principal use WES shall not exceed the height allowed under a Determination of No Hazard to Air Navigation by the Federal Aviation Administration under 14 CFR Part 77.
- C. Sound: The sound pressure level generated by a principal use WES shall not exceed 30 dBA (Leq (1-hour)) measured at the nearest point on the shared property line of an adjacent non-participating lot. Decibel modeling shall use the A-weighted scale as designed by the American National Standards Institute.
- D. Lighting: The system shall be equipped with functioning light-mitigating technology. To allow proper conspicuity of a wind turbine at night during construction, a turbine shall be lit with temporary lighting until the permanent lighting configuration, including the light-mitigating technology, is implemented. A temporary exemption from the requirements of this section may be granted if installation of appropriate light-mitigating technology is not feasible. A request for a temporary exemption must be in writing and state all of the following:
 - 1. The purpose of the exemption;
 - 2. The proposed length of the exemption;
 - 3. A description of the light-mitigating technologies submitted to the Federal Aviation Administration;
 - 4. The technical or economic reason a light-mitigating technology is not feasible;All other lighting shall comply with Section 54.
- E. Shadow Flicker: Shadow flicker shall not exceed 30 hours per year under planned operating conditions as indicated by industry standard computer modeling and measured at the exterior wall of an occupied community building or non-participating residence.
- F. Signal Interference: A principal use WES shall meet any standards concerning radar interference, lighting, or other relevant issues as determined by the Michigan Public Service Commission in any implementation or rule-making process.
- G. A principal use WES shall not display lettering, company insignia, advertising, or graphics of any kind on any part of the system, except such non-obtrusive lettering and/or insignia intended to identify the manufacturer, which shall not be visible from any adjoining property or adjoining public road or other public way. Additional signage may be permitted subject to the requirements of Section 55.
- H. A principal use WES shall be properly maintained in accordance with the manufacturer's recommendations and so as to be operable as designed as evidenced by a maintenance plan and schedule submitted with the application. If the maintenance procedures include the use of detergents or other non-organic substances to clean the solar collector panels and/or any other apparatus, the intended use of such products shall be disclosed in the application, with appropriate details on the type of product, the frequency and quantity of use, and the soil/water quality protection measures to be utilized as part of the maintenance plan. Any such soil/water quality protection measures shall also be included in a stormwater management plan submitted as part of the application and shown on the site plan.

- I. Michigan Public Service Commission requirements: A principal use WES shall comply with any more stringent requirements adopted by the MPSC as provided in MCL 460.1226(8)(b)(vii).

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3. **Energy Storage System, Principal use:** A principal use energy storage system (ESS), where permitted, is subject to special land use approval by the Planning Commission, and/or other applicable authority, and shall meet the following requirements:

- A. Full compliance with the latest released editions as of the time a Building Permit is requested, of the following standards. In case of conflict, the more stringent requirement shall apply:

Standard	Title	Applicability
NFPA 855	Standard for the Installation of Stationary Energy Storage Systems	<i>Primary installation code; governs siting, separation, suppression, and BMS requirements</i>
UL 9540	Standard for Energy Storage Systems and Equipment	<i>System-level listing and certification</i>
UL 9540A	Test Method for Evaluating Thermal Runaway Fire Propagation	<i>Thermal runaway propagation testing; required for NFPA 855 compliance above threshold quantities</i>
IEC 62619	Safety Requirements for Secondary Lithium Cells and Batteries for Use in Industrial Applications	<i>Cell and battery safety; design, test, and marking requirements</i>
IEC 62933-5-2	Electrical Energy Storage (EES) Systems — Safety Requirements	<i>Grid-scale ESS safety</i>
IEEE 1547	Standard for Interconnection and Interoperability of Distributed Energy Resources	<i>Grid interconnection; applicable to utility-scale and grid-tied systems</i>
NERC CIP	Critical Infrastructure Protection Standards	<i>Cybersecurity; applicable to systems connected to the bulk electric system</i>
ASCE 7	Minimum Design Loads and Associated Criteria for Buildings and Other Structures	<i>Seismic and wind loading for enclosures and anchorage</i>
IBC	International Building Code	<i>Enclosure structural compliance</i>
NFPA 70 (NEC)	National Electrical Code	<i>Electrical installation; Articles 480, 706</i>
FM Global DS 5-33	Data Sheet for Large-Scale Battery Energy Storage Systems	<i>Insurance carrier requirements; loss prevention</i>
Other applicable codes		

- B. Battery Management System (BMS) or Energy Storage Management System (ESMS) and Monitoring Requirements.

1. General BMS or ESMS Requirements. The ESS shall incorporate a Battery Management System (BMS) or Energy Storage Management System (ESMS) that continuously monitors, controls, and reports the status of the energy storage assembly.

The BMS shall also run multiple diagnostic algorithms to assess proper operation and communicate any error conditions or abnormalities.

2. Cell-Level Monitoring. The BMS shall provide real-time monitoring at the individual cell level. At minimum, the following parameters shall be measured for each cell or cell group (consisting of parallel cells only):
 - a. Cell voltage, monitored continuously with a resolution of no greater than ± 10 mV (millivolt) and sampled at a minimum frequency of 1 Hz (hertz).
 - b. State of charge.
 - c. Representative cell temperatures, with a resolution of no greater than $\pm 0.5^{\circ}\text{C}$ and sampled at a minimum frequency of 1 Hz (hertz). These temperatures shall be documented as to which locations are chosen and how many used as to capture all perimeters of the cell modules as well as the centermost cell (i.e. top-most, bottom-most, left-side, right-side, and center cell at the minimum)
3. Module and System-Level Monitoring. In addition to cell-level monitoring, the BMS shall monitor the following parameters at the module, rack, and system levels:
 - a. Module and rack voltage, current, and temperature.
 - b. State of Charge and State of Health at the module and system level.
 - c. Insulation resistance / ground fault detection, with automatic isolation upon detection of a ground fault exceeding the Manufacturer's specified threshold.
 - d. Contactor/relay status for all primary disconnect devices.
 - e. Cooling system status, including inlet/outlet temperature differential (liquid-cooled systems), or airflow confirmation (forced-air systems).
4. 24/7 Network Operations Center (NOC). BMS or ESMS data from all ESS installations shall be monitored continuously, twenty-four hours per day, seven days per week, by a Network Operations Center (NOC) staffed by trained personnel with working knowledge of the ESS systems under their oversight. The NOC shall:
 - a. Immediately relay alarm notifications indicative of thermal runaway or other critical battery failure events to the system owner, operator, and designated emergency contacts;
 - b. Assist in determining, in coordination with the central station, which alarms constitute critical incidents warranting fire department notification; and
 - c. Be available, upon request from on-scene incident command, to relay relevant BMS data to local emergency responders to guide emergency response.
5. Video Surveillance. ESS installations subject to this Section shall be equipped with a video surveillance system providing continuous coverage of the ESS facility. Video surveillance shall be used as both a continuous monitoring tool and a post-event analysis resource. Requirements include:
 - a. Real-time monitoring of video feeds by the NOC, or made available to first responders during an incident, where required by the Oshtemo Fire Department;
 - b. Retention of recorded video for not less than seventy-two (72) hours under normal conditions; in the event of a fire or incident requiring fire department response, video records shall be preserved and made available to the Oshtemo Fire Department for post-incident investigation; and

- c. Video surveillance system access credentials and procedures shall be documented in the FRP.
6. Alarm and Protective Action Thresholds. The BMS shall implement a tiered alarm and protective action architecture with at minimum the following levels:
- a. Level 1 — Warning: a condition that deviates from normal operating parameters and requires operator notification but does not require immediate automatic protective action. Warning conditions shall be logged and shall generate a remote alarm notification within 60 seconds of detection.
 - b. Level 2 — Alarm: a condition that presents a risk of equipment damage or safety hazard and shall trigger automatic protective action, including but not limited to power derating or cessation of charge/discharge operations.
 - c. Level 3 — Emergency / Fault: a condition indicating imminent or active thermal runaway, ground fault, or fire. This level shall trigger immediate initiation of automatic disconnect of the ESS from all connected loads and sources, initiation of fire suppression (where automatically triggered), and immediate alarm notification to the building fire alarm system and remote monitoring platform. Alarm notification shall satisfy NFPA 72 and include audio and visual alarms.

The Manufacturer's complete Alarm and Protective Action Matrix as part of the system documentation submittal, identifying each alarm condition, its associated monitoring parameter, threshold value, tier classification, and resultant protective action shall be submitted by the applicant/owner.

7. Remote Monitoring and Data Logging. The ESS shall be equipped with a remote monitoring interface that satisfies the following requirements:
- a. All cell-level, module-level, and system-level parameters identified in Sections 2.2 and 2.3 shall be accessible via a remote monitoring platform using open-protocol communications (Modbus TCP/IP, DNP3, IEC 61850, or approved equivalent).
 - b. All monitoring data shall be logged locally with a minimum retention period of 90 days at 1-minute intervals and shall be exportable in a non-proprietary format (CSV or equivalent).
 - c. All alarm and protective action events (Levels 1, 2, and 3) shall be time-stamped, logged, and transmitted to the remote monitoring platform within 60 seconds of the triggering event.
 - d. The remote monitoring platform shall provide automated notification (email, SMS, or equivalent) to designated personnel upon any Level 2 or Level 3 alarm condition.
 - e. Remote monitoring shall be available on a continuous 24/7 basis.

C. Cybersecurity

Cybersecurity is organized into architectural layers and protocols designed to protect against unauthorized access, malicious control, and data theft. Proof of satisfying the below cybersecurity requirements shall be provided within 10 business days to the Township Clerk upon request.

1. General Cybersecurity Requirements. The ESS control and monitoring systems shall be designed and configured to protect against unauthorized access, manipulation, and cyberattack. Cybersecurity requirements shall apply to all digital interfaces, including BMS communications, remote monitoring platforms, SCADA/EMS connections, and firmware update mechanisms.
2. Network Segmentation and Defense.
 - d. Isolation. Firewalls shall be used to create distinct zones separating the ESS control network from enterprise or public-facing networks.
 - e. Deep Packet Inspection (DPI). Industrial-grade firewalls capable of inspecting traffic for specific industrial protocols (ex. Modbus, DNP3) to filter out unauthorized or malformed commands shall be deployed.
 - f. Data Diodes. Use of data diodes to ensure information can flow out for monitoring but no control signals can flow in from unsecured networks may be required by the Planning Commission as recommended by the Township's consultant.
3. Access Controls. The following access control requirements shall apply to all ESS digital systems.
 - a. All factory-default usernames, passwords, and cryptographic keys shall be changed prior to commissioning. Factory defaults shall not be used in any installed configuration.
 - b. Role-based access control (RBAC) shall be implemented, distinguishing at minimum between read-only monitoring access, operator-level control access, and administrator-level configuration access.
 - c. Multi-factor authentication (MFA) shall be required for all remote access sessions and for all administrator-level access.
 - d. All access attempts (successful and failed) shall be logged with user identity and timestamp. Logs shall be retained for a minimum of 12 months.
 - e. Unused communication ports, services, and protocols shall be disabled. The Manufacturer shall provide a network architecture diagram identifying all enabled communication interfaces, protocols, and ports.
4. Firmware and Software Security. The Manufacturer shall provide a documented process for firmware and software updates that includes:
 - a. A documented vulnerability disclosure and patch management policy, including target patch timelines for critical, high, and medium severity vulnerabilities.
 - b. Notification to the Owner of any security vulnerability affecting the installed ESS within 30 days of discovery, with an associated timeline for remediation.

D. Enclosure Structures.

1. General Enclosure Requirements. ESS enclosures shall be designed, manufactured, and installed to provide structural integrity, environmental protection, thermal management, fire compartmentalization, and safe personnel access. Enclosures shall be listed or labeled in accordance with UL 9540.
2. Structural Design. Enclosure structures shall comply with the following structural requirements:

- a. Enclosures shall be designed for the wind and snow loads applicable to the installation site per ASCE 7 and the International Building Code (IBC).
 - b. All structural steel components shall be coated or galvanized to prevent corrosion in accordance with the environmental classification of the installation site. Minimum coating thickness and type shall be specified by the Manufacturer and documented in the submittal package.
 - c. Enclosure floor loading capacity shall be documented and shall account for the full installed weight of battery modules, racks, power conversion equipment, and thermal management systems, with a minimum safety factor of 1.5.
 - d. The enclosure shall be designed to prevent water intrusion. For outdoor installations, the enclosure shall achieve a minimum Ingress Protection rating of IP 55 per IEC 60529. For indoor installations, the enclosure shall achieve a minimum NEMA 1 rating. Where wash-down environments exist, NEMA 4 or IP 66 shall be required.
 - e. Enclosures and their anchorage systems shall be designed to withstand seismic forces in accordance with ASCE 7 for the applicable Seismic Design Category (SDC) of the installation site. The Manufacturer shall provide a seismic certification report stamped by a licensed structural engineer.
3. Compartmentalization and Thermal Separation. ESS enclosures shall incorporate compartmentalization measures to limit the spread of fire, heat, and off-gas between battery modules and between the battery array and power conversion equipment:
 - a. Battery modules shall be physically separated from power conversion equipment (inverters, transformers, disconnects) by a fire-rated partition or by separate enclosures with a minimum fire-resistance rating of 1 hour, unless otherwise demonstrated acceptable by UL 9540A testing.
 - b. Where multiple battery racks or modules are housed within a single enclosure, the enclosure shall be designed such that thermal runaway in any single module does not propagate to adjacent modules under the conditions evaluated by UL 9540A testing. Documentation of UL 9540A test results demonstrating compliance with this requirement shall be provided as part of the submittal package.
 - c. All penetrations through fire-rated enclosure walls or partitions shall be sealed with listed firestop assemblies maintaining the required fire-resistance rating.
4. Ventilation and Thermal Management. Enclosure ventilation and thermal management systems shall satisfy the following requirements:
 - a. The enclosure shall provide sufficient ventilation or active cooling to maintain battery module temperatures within the Manufacturer's specified operating temperature range under maximum ambient temperature and maximum charge/discharge loading conditions.
 - b. For forced-air cooling systems, airflow shall be designed to prevent hot spots at individual modules. The Manufacturer shall provide thermal modeling or testing data demonstrating uniform temperature distribution within the enclosure under peak loading conditions.
 - c. For liquid-cooled systems, the cooling circuit shall be designed with leak detection capability. Any coolant leak detected within the enclosure shall trigger a Level 2 Alarm per Section B.6.b and shall automatically initiate protective shutdown.
 - d. Ventilation exhaust shall be directed away from personnel access areas, combustible materials, and building air intakes. For systems installed indoors, exhaust shall be ducted to the exterior of the building.

5. Personnel Access and Safety. Enclosures shall incorporate the following personnel safety features:
 - a. Minimum working clearances inside the enclosure shall comply with NFPA 70 (NEC) Article 110 for the applicable voltage level.
 - b. Interior lighting, rated for the installation environment, shall be provided and shall activate automatically upon enclosure door opening.
 - c. Emergency egress shall not be obstructed. Outward-swinging doors or sliding panels shall be used for all personnel access points.
 - d. Arc flash hazard labeling compliant with NFPA 70E shall be affixed to all enclosure doors providing access to energized conductors.

E. Fire Suppression System Requirements to prevent thermal propagation.

1. General Fire Protection Requirements. The ESS fire protection system shall be designed to detect, suppress, and contain fire within the ESS enclosure and to prevent thermal runaway propagation from cell to cell, module to module, and enclosure to enclosure. Fire protection systems shall be designed, installed, tested, and maintained in accordance with NFPA 855, NFPA 13 (where sprinklers are used), and the applicable requirements of NFPA 72 for initiating and notification devices.
2. Thermal Runaway Propagation Testing. Prior to system installation, the Manufacturer shall provide documentation demonstrating that the ESS has been tested for thermal runaway fire propagation in accordance with UL 9540A. The following conditions apply:
 - a. UL 9540A testing shall be performed at the system level (full-scale or a representative system configuration acceptable to the Township by an accredited third-party testing laboratory).
 - b. Test reports shall demonstrate that thermal runaway initiated in a single cell does not propagate beyond the boundaries established in the NFPA 855 maximum quantity and UL 9540 separation tables applicable to the installation configuration.
 - c. UL 9540A test reports shall be made available to the Township upon request and shall be included in the submittal package.
3. Detection System Integration. The fire detection system shall be integrated with the BMS alarm architecture described previously and shall comply with the following:
 - a. Listed spot-type heat detectors, rate-of-rise detectors, or aspirating smoke detection (ASD) systems shall be installed within the ESS enclosure. The detection technology selected shall be appropriate for the anticipated thermal runaway off-gas and combustion products of the specific battery chemistry.
 - b. Gas detection as specified in Section 3.E.4 shall serve as the primary early-warning mechanism. A confirmed gas detection event shall constitute a pre-action signal and shall activate pre-discharge notifications prior to suppression agent release where applicable.
4. Early Warning Gas Detection. The ESS enclosure should incorporate a multi-gas detection system capable of detecting the off-gasses characteristic of early-stage thermal runaway prior to visible flame or smoke. At minimum, the detection system should address the following:
 - a. Off-gas detection required. The ESS shall include a dedicated off-gas / electrolyte-vapor detection system capable of detecting thermal-runaway precursor gases at the off-gassing stage, prior to smoke or open flame, when warranted based on

- chemistry and system.
- b. Target gas species. Detection shall cover, at minimum, hydrogen (H₂) and carbon monoxide (CO). Monitoring of electrolyte vapors and hydrogen fluoride (HF) is required where chemistry warrants. H₂ alarm threshold shall be set at or below 25% of the lower flammable limit ($\leq 1\%$ v/v).
 - c. Independence from BMS. The detection system shall operate independently of the Battery Management System (BMS) and shall identify the affected rack/module. It shall remain functional in the event of a BMS fault.
 - d. Interlocks. Detection events shall automatically (a) initiate controlled shutdown / electrical isolation of the affected unit, (b) activate enclosure exhaust / ventilation, and (c) annunciate to the fire alarm panel per NFPA 72 and to remote monitoring.
 - e. Sensor placement & thresholds. Sensor quantity and placement shall be designed to off-gas accumulation points within each enclosure. Sensors shall carry third-party validation (e.g., UL 2075).
 - f. Gas detection shall be performed within the battery enclosure. For systems with multiple enclosures or compartments, detection shall be provided within each separately enclosed compartment.
5. Suppression System Requirements. The active suppression system for the ESS shall meet the following requirements:
- b. A listed, automatically actuated suppression system shall be installed within each battery enclosure or compartment. Acceptable suppression agent types include clean agent (e.g., HFC-227ea, FK-5-1-12), water mist, or inert gas systems, selected based on compatibility with the battery chemistry, enclosure volume, and other key parameters as determined by the manufacturer.
 - c. The suppression system shall be designed and installed by a licensed fire protection contractor in accordance with the applicable NFPA standard for the agent type (NFPA 2001 for clean agents, NFPA 750 for water mist, NFPA 2 for hydrogen, etc.).
 - d. The suppression system shall be capable of operating on battery power (independent of utility power) for a minimum of 24 hours following a utility outage.
 - e. Suppression agent quantity and nozzle design shall be sufficient to achieve the Manufacturer's specified extinguishing concentration throughout the protected volume, accounting for enclosure leakage, as demonstrated by a hold-time test conducted per the applicable NFPA standard.
 - f. Manual release stations shall be provided at each enclosure and at the site entrance or control point. Manual stations shall be clearly labeled and shall be accessible without requiring entry into the hazard area.
 - g. Post-discharge alarms shall be provided to notify personnel of an activated suppression event. Guidelines shall be provided about safe reentry.
 - h. Response procedures shall account for the potential for re-ignition. Suppression of thermal runaway does not extinguish the internal electrochemical reaction within individual cells. Suppression systems are intended to prevent thermal propagation and limit external fire spread.
6. Required Submittals:
- a. UL 9540 system listing and complete UL 9540A test report for the as-supplied configuration.
 - b. Gas detection system datasheets, sensor placement drawings, threshold/interlock logic, and UL 2075 (or equivalent) validation.
 - c. Fire suppression design package with hydraulic/agent calculations and NFPA 855 /

- NFPA 13 compliance basis.
- d. Hazard Mitigation Analysis (HMA) per NFPA 855 and integrated Emergency Response Plan.
 - e. Factory Acceptance Test (FAT) report covering fire detection/suppression function, thermal management, and BMS protection logic.
- F. Manufacturer Inspection Reports and Quality Assurance. The following documents shall be provided.
- 1. General Quality Assurance Requirements. The ESS manufacturer must maintain and operate a documented quality management system (QMS) for the design, manufacture, assembly, and testing of the ESS. The QMS must conform to ISO 9001 or an equivalent standard. Evidence of current QMS certification shall be submitted with the application for a Building Permit.
 - 2. Factory Acceptance Testing. Each ESS unit shall undergo Factory Acceptance Testing (FAT) at the Manufacturer's facility prior to shipping. At a minimum, FAT shall include and document results for the following and shall be submitted with the application for a building permit.
 - a. Thermal Management Performance: Verification that the thermal management system maintains all battery modules within the Manufacturer's specified temperature range under simulated maximum ambient and maximum load conditions. Test duration shall be sufficient to establish thermal steady-state. Inlet and outlet temperatures, coolant flow rates (liquid-cooled), and module-level temperature uniformity shall be recorded.
 - b. Electrical Circuitry Integrity: Verification of all high-voltage and low-voltage wiring, contactor and relay operation, overcurrent protection coordination, ground fault detection sensitivity, and BMS communication continuity. Insulation resistance testing (minimum 1,000 VDC megger, per IEEE 43 or equivalent) shall be performed on all power wiring. Results shall be documented with pass/fail criteria defined in the Manufacturer's FAT procedure.
 - c. Fire Suppression System Commissioning: Functional test of all detection devices (simulated), suppression system supervisory signals (pressure switches, flow switches, agent quantity), alarm and notification device actuation, and BMS integration (Level 3 alarm trigger to suppression pre-discharge signal). Actual suppression agent discharge is not required during FAT; simulated test mode is acceptable provided full-circuit continuity is verified.
 - d. Rated Capacity Verification: The ESS shall be charged to 100% SoC and discharged at rated power to minimum SoC, with energy throughput recorded. Delivered capacity shall be no less than 98% of nameplate rated capacity at the test conditions (temperature, rate) specified by the Manufacturer. Capacity results shall be documented with ambient temperature, charge/discharge rates, and cutoff voltages recorded.
 - e. BMS Functional Verification: Validation of all cell-level and system-level monitoring parameters per Section 3.B.2, including alarm threshold testing (simulated), data logging continuity, and remote monitoring connectivity.
 - f. Protection Device Coordination: Testing of all automatic protective actions (overcurrent, overvoltage, undervoltage, over-temperature, ground fault) to verify trip accuracy and response time against the Manufacturer's specifications.

The applicant shall produce a signed FAT Report from the Manufacturer documenting

- test procedures, pass/fail criteria, measured results, and any nonconformances with their disposition.
3. **Cell and Module Traceability.** The ESS Manufacturer shall implement a traceability system that enables individual cells and modules installed in each ESS unit to be traced to their manufacturing lot, production date, incoming inspection results, and formation/grading data. The following traceability documentation shall be provided within 10 business days upon request of the Township Clerk:
 - a. Cell lot/batch numbers for all cells installed in each ESS serial number.
 - b. Module serial numbers and their assigned rack/slot positions within the ESS.
 - c. Incoming inspection acceptance records for all cells and modules, including capacity grading results.
 - d. Any cells or modules subject to nonconformance disposition during production shall be identified with the nature of the nonconformance and corrective action taken.
 4. **Third-Party Certifications and Listing Documentation.** Prior to installation, the applicant shall provide Manufacturer's third-party certifications and listing documentation:
 - a. Current UL 9540 listing certificate for the complete ESS, including model number(s) applicable to the project.
 - b. Current UL 9540A test report(s) for the installed system configuration, as specified in Section 3.E.2.
 - c. IEC 62619 (or equivalent) cell-level safety certification for the battery cells used in the system.
 - d. Seismic certification report per Section 3.D.2.
 - e. IEEE 1547 interconnection compliance documentation and, where applicable, NERC CIP cybersecurity compliance attestation.
 - G. **Groundwater Plume Modeling.** A hydrogeological migration study mapping a 20-year projected travel of groundwater from the site and any potential impacts to groundwater levels, aquifers, or nearby surface waters based on extraction needs and demands, prepared by a third-party Michigan licensed professional engineer with expertise in groundwater modeling, shall be submitted. The Township's subject matter expert shall define the scope of the study including but not limited to assumed release rates, applicable site specific chemicals, soil and aquifer data, groundwater elevations and flow direction, nearby wells and surface waters, model calibration, uncertainty analysis, and mitigation thresholds.
 - H. **Air Dispersion Analysis.** A comprehensive analysis, by an individual or firm experienced in air quality dispersion analysis, simulating a fire caused by a thermal runaway event. The simulation must strictly follow the U.S. EPA Guideline on Air Quality Models (40 CFR Part 51, Appendix W, as may be amended). A certified third-party meteorologist or a Michigan licensed environmental engineer must verify all modeling inputs.
 - I. **Secondary Containment.** Secondary containment of all stormwater and firefighting water shall be provided as required in the Oshtemo Township Performance Standards for Groundwater Protection Within Wellhead Protection Capture Zones and Stormwater Quality Management regardless of whether or not the property is within a wellhead capture zone.
 - J. **Spill Contingency Plan.** The applicant shall demonstrate containment capacity for the greater of: (1) the firefighting-water volume identified through the project-specific hazard mitigation analysis and emergency-response plan, plus precipitation pursuant to the

Township's stormwater management requirements; or (2) another volume approved by the Fire Chief and the Township Engineer or other qualified professional selected by the Township Engineer. Containment systems shall be chemically compatible, sufficiently impermeable, hydraulically isolated from groundwater and stormwater infiltration facilities, equipped with controlled discharge mechanisms, and maintained available during the operational life of the facility through decommissioning. No contained liquid may be discharged until characterized by an independent laboratory and shown to satisfy applicable water-quality and disposal requirements.

- K. **Baseline Data and Continued Monitoring.** Baseline soil and groundwater sampling at the property shall be obtained prior to issuance of a Building Permit. Permanent monitoring wells shall be established at locations agreed upon by the Township Engineer or other qualified professional selected by the Township Engineer on his/her behalf.
- L. **Long-term Groundwater Monitoring.** Groundwater from the monitoring wells shall be tested annually for metals, PFAS (if equipment warrants), VOCs, conductivity, pH, lithium and fluoride (where appropriate). The Township Engineer or other qualified professional selected on his/her behalf may add to the list of contaminants to include in the testing. The annual test results shall be sent to the Township Clerk by March 31 of each year.
- M. **Setbacks:** Setback distance shall be measured from the stated location below to the nearest edge of the perimeter fencing of the principal use ESS as follows:
 - 1. Sensitive Land Uses: 2,000 feet from the nearest point on the outer wall of the building or residence.
 - 2. Occupied community buildings on non-participating properties: 400 feet from the nearest point on the outer wall of the building.
 - 3. Public road right-of-way: 300 feet from the nearest edge of a public road right-of-way.
 - 4. Non-participating properties: 300 feet from the nearest shared property line.
 - 5. Specialty Crop Farms: 1,000 feet from the nearest property line.
 - 6. Combustible vegetation or materials, refuse or debris: 10 feet from any side of the ESS installation.
- N. **Sound:** The sound pressure level of a principal use ESS shall not exceed 30 dBA (Leq (1-hour)) as modeled at the property line shared with an adjacent non-participating residential lot. Decibel modeling shall use the A-weighted scale as designed by the American National Standards Institute.
- O. **Lighting:** The principal use ESS shall comply with Section 54.
- P. **Drive aisles:** Internal and perimeter drive aisles shall comply with Section 52.50.C.
- Q. **Emergency Response Plan.** In addition to the provisions of Section B.3.p, an Emergency Response Plan shall be in compliance with 2026 NFPA 855, specifically Annex G. The ERP shall not be construed to supersede or replace the Emergency Operations Plan (EOP) required by NFPA 855; both shall be maintained.
 - 1. The ERP shall be developed by or under the supervision of the ESS owner or operator, in consultation with the Oshtemo Township Fire Department, to ensure alignment with the department's procedures, capabilities, and equipment. The owner or operator shall

document all coordination efforts.

2. The ERP shall be submitted to the Oshtemo Township Fire Department as part of the application for special use approval. No certificate of occupancy or operating permit shall be issued without Oshtemo Township Fire Department review and approval; such review and approval shall not be unreasonably withheld. A current approved copy shall be:
 - a. Maintained on-site in a weather-resistant enclosure outside the perimeter fence, accessible to first responders without requiring facility entry;
 - b. Provided to the Oshtemo Township Fire Department and submitted to the Oshtemo Township Fire Department after being updated with each revision; and
 - c. Made available to the Oshtemo Township Fire Department within twenty-four (24) hours upon request.
 3. The ERP shall be reviewed and resubmitted to the Oshtemo Township Fire Department not less than every three (3) years, and additionally following:
 - a. Any material change to the ESS;
 - b. Any ESS incident requiring fire department response;
 - c. Change in ownership or operator; or
 - d. Change in Oshtemo Township Fire Department contacts or protocols.
- R. Fire Response Plan. In addition to the provisions of Section B.3.o, a Fire Response Plan satisfying the requirements of Appendix B shall be provided before a Building Permit may be issued.
- S. Safety Signage: The principal use ESS shall post signs in compliance with IFC 2024, NFPA 70 and NFPA 855 or any applicable successor codes in place at the time of commencement of construction including information on the system type and technology, special hazards, fire suppression system and 24-hour emergency contact information, including reach-back phone number. A clearly visible warning sign concerning voltage shall be placed at the base of all pad-mounted transformers and substations. Signs shall be legible, weather-resistant, and maintained in good condition for the operational life of the facility
- T. Perimeter Fencing and Signage. In addition to the signage on ESS enclosures, signage shall be posted on all perimeter security fences and barriers at intervals not exceeding two hundred feet (200 feet). Signs shall be legible, weather-resistant, and maintained in good condition for the operational life of the facility. Perimeter signage shall be accessible from outside the fence line and shall include:
- a. The name and 24-hour emergency contact information for the owner or operator;
 - b. A site map identifying the locations of ESS enclosures, access points, utility disconnects, and isolation controls;
 - c. Identification of relevant hazard warnings, including battery chemistry type and associated risks;
 - d. The isolation zone distance that response personnel should maintain from the ESS during a fire or explosion risk event; and
 - e. The date the signage was last verified to be accurate, updated annually.

Additional signage may be permitted subject to the requirements of Section 55.

- U. Explosion Control Panel Identification. Where explosion control systems (deflagration

venting panels or explosion prevention systems) are installed, all panels, venting devices, and associated equipment shall be clearly and permanently labeled to enable first responders to identify and stay clear of hazard zones associated with potential overpressure events.

- V. Operation and Maintenance Manual. An Operation and Maintenance Manual satisfying Appendix C shall be provided. Such plan shall describe continuing ESS maintenance and property upkeep, as well as design, construction, installation, testing and commissioning information and shall meet all requirements set forth in Appendix C, the Fire Code, and Michigan Construction Code.
- W. For lithium ion installations, a pre-incident plan for responding to fires, explosions and other emergency conditions developed with the Oshtemo Fire Department satisfying 2026 NFPA 855 or any successor standard.
- X. Michigan Public Service Commission Requirements. A principal use ESS shall comply with any more stringent requirements adopted by the MPSC as provided in MCL 460.1226(8)(c)(v).
- Y. Repair and Augmentation. In addition to repairing or replacing system components to maintain the system, the system may at any time be augmented without the need to submit a new site plan provided the augmentation is within the same footprint (i.e., same dedicated use building or on footings/foundations in the same location) as the original permit. If there is a change in the battery chemistry, an updated Hazard Mitigation Analysis, Fire Response Plan and Emergency Response Plan shall be provided. When a system is anticipated to be augmented over its lifetime by adding additional components, the applicant shall apply for the final/augmented site arrangement.
- Z. Modifications that increase an ESS facility footprint or total energy capacity by 10% or more require a new site plan and special use approval by the Planning Commission.
- AA. Any replacement of a battery or transformer, major maintenance, emergency drills or planned outages requires written notification to the Township Clerk and/or designated personnel at least 30 days prior.
- BB. Any increase in energy capacity requires written notification to the Township Clerk and/or designated personnel at least 30 days prior.. All obligations, including but not limited to the Community Host Agreement and decommission agreement, must be updated to reflect the increase in energy capacity. The financial surety shall be increased if there is an increase in energy capacity.
- CC. Hazard Mitigation Analysis. A Hazard Mitigation Analysis in compliance with NFPA 855 (4.4) shall be provided.
- DD. Public Safety. The Emergency Response Plan and Fire Response Plan shall provide reasonable protection of the public health, safety and welfare including but not limited to an emergency shutdown procedure in place and shall provide the Oshtemo Fire Department site safety plans to include electrical, fire, smoke, and hazardous materials release, emergency response protocols and identification of typical hazards related to, electrical, fire, smoke and hazardous materials pertinent to the system. Upon request, all systems shall provide first responder training at the site.

EE. Annual Meeting and Report. In addition to the requirements of Section C.1.g, an Annual Meeting shall be held by the Planning Commission to review the Annual Report. The Annual Report shall be provided to the Township Clerk no later than March 31 of each year for the life of the ESS, the Annual Meeting shall be scheduled thereafter. The Annual Report shall include the following information for the reporting period:

1. Facility and Permit Identification
2. Physical Modifications and Equipment Changes:
 - a. All material modifications to the ESS, including augmentation capacity changes, or configuration changes;
 - b. All component replacements, including battery modules, inverters, BMS units, fire protection equipment, or structural elements;
 - c. Whether any modification triggered special land use approval / amendment under Section 10; and,
 - d. The date and description of any sealed as-built drawing updates filed with the Township Clerk.
3. Operational Performance Summary. The Annual Report shall provide a summary of ESS operation performance, including:
 - a. Total energy discharged during the reporting period (MWh), if metered and available;
 - b. Total number of operating hours and any extended outages exceeding thirty (30) days;
 - c. Summary of BMS fault and alarm events, including frequency and resolution;
 - d. Summary of thermal management system performance, including any overtemperature events; and
 - e. General assessment of battery module health and state of capacity degradation, if available.
4. Safety Incidents and Emergency Service Calls. The Annual Report shall disclose:
 - a. All incidents that required a response from the local fire department, emergency medical services, or law enforcement, including date, nature of incident, responding agencies, and resolution;
 - b. All thermal runaway events, fires, explosions, or hazardous material releases, regardless of whether emergency services were dispatched;
 - c. All BMS alarms or fault conditions that resulted in automatic or manual ESS shutdown;
 - d. Any regulatory agency notices, citations, or inspections related to ESS safety or compliance; and
 - e. Any voluntary or mandatory recalls of ESS equipment issued by the manufacturer or a regulatory agency during the reporting period.
5. Maintenance and Service Records Summary. The Annual Report shall include a summary of O&M activities, including:
 - a. Confirmation that all required inspections and testing were performed on schedule, with dates;
 - b. Summary of significant maintenance findings and corrective actions taken;
 - c. Any deferred maintenance items and the planned schedule for resolution; and
 - d. Confirmation that the O&M Manual, Fire Response Plan, and Emergency

Response Plan are current and reflect as-built conditions.

6. Complaints and Community Relations. The Annual Report shall disclose:
 - a. All written complaints received from neighboring property owners, residents, or the public concerning the ESS, including complaints related to setbacks, noise, visual impacts, lighting, odors, road use, or safety;
 - b. The disposition and resolution of each complaint; and
 - c. Any unresolved complaints and the anticipated resolution timeline.
 7. Insurance and Financial Assurance. The Annual Report shall include:
 - a. Confirmation that required liability insurance coverage is in force, with the name of the insurer, policy number, coverage limits, and expiration date;
 - b. Confirmation that required financial assurance for decommissioning (surety bond, letter of credit, or equivalent) remains in full force and effect; and
 - c. Notice of any material change in insurance carrier, coverage terms, or financial assurance status during the reporting period.
 8. Emergency Response Plan Status. The Annual Report shall confirm:
 - a. That the Emergency Response Plan (ERP) has been reviewed for accuracy and is current;
 - b. Whether annual first responder training was offered, including the date, attendees, and any documentation of offers declined by the fire department; and
 - c. Whether any changes to the ERP were made during the reporting period, and if so, whether an updated ERP was submitted to the Oshtemo Fire Department and Township Clerk.
 9. Personnel and Contact Updates. The Annual Report shall confirm or update:
 - a. Current 24-hour contact information for the owner, operator, and all designated emergency contacts;
 - b. The identity and qualifications of currently designated Fire Mitigation / Hazard Support Personnel; and
 - c. Any change in ownership or operational responsibility during the reporting period.
 10. Approval Compliance Certification. The Annual Report shall include a signed certification by the owner or operator attesting that:
 - a. The ESS has been operated in material compliance with the special land use approval, this ordinance, and all applicable state and federal laws during the reporting period;
 - b. All information provided in the Annual Report is accurate and complete to the best of the owner/operator's knowledge; and
 - c. Any known material violations or non-compliance issues are identified and a corrective action schedule is provided.
 11. Environmental compliance (reporting on compliance with all relevant environmental regulations and standards such as but not limited to the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106);
- FF. Bi-Annual Re-Certification. In addition to the Annual Report, the owner or operator shall submit a bi-annual re-certification to the Township Clerk every two (2) years from the date of initial special land use approval. The re-certification shall:

- a. Confirm that the ESS equipment continues to meet applicable safety standards, including UL 9540 listing;
 - b. Confirm that the O&M Manual and ERP are current;
 - c. Confirm that required financial assurance for decommissioning has been updated to reflect current cost estimates; and
 - d. Be signed and certified by the owner or operator and submitted under penalty of perjury or equivalent legal attestation.
- GG. Pollution Liability Insurance shall be maintained until the site is fully decommissioned with annual proof provided to the Township Clerk by the owner that the pollution liability insurance remains sufficient and in effect. The Township shall be named as additional insured on such policy. The pollution liability insurance shall provide for, in the case of a thermal runaway event, the following:
- a. Full clean-up of any soil and/or groundwater contamination;
 - b. Replacement of any private wells impacted within a 20-year period following an incident;
 - c. The cost to extend public water and connect residences if private wells are no longer permitted due to contamination;
 - d. Expenses incurred by residents in the event they are evacuated and/or displaced from their homes;
 - e. Loss of crops and/or farm animals;
 - f. On going studies of environmental contamination and groundwater evaluations for a period of 20 years following an event;
 - g. Maintain ten million (\$10,000,000) dollars in liability coverage.
 - h. *What else?*
9. **Hybrid Energy System, Principal use:** A hybrid principal use system incorporating any combination of energy storage system (ESS), solar energy system (SES) and wind energy system (WES), where permitted, is subject to special land use approval by the Planning Commission, and/or other applicable authority, and shall meet the above requirements based upon the applicable energy systems. When there is a conflict, the stricter provision shall apply.

Section 48.170 – Specific Provisions, Energy Systems, Private Accessory

The following requirements shall apply to Private Accessory Systems.

1. Solar Energy Systems, Private Accessory.
 - A. Maximum Height: The system may be mounted on a building and/or may be ground mounted.
 1. The height of a building-mounted system on a principal building or accessory building shall not exceed the applicable roof height limit as specified in the ordinance for the district, as applicable.
 2. The height of a ground-mounted system, at full tilt, shall not exceed a height of 10

feet.

- B. **Roof Placement:** A roof-mounted system shall be placed on the roof in compliance with requirements imposed by the applicable Fire Code and Construction Code.
- C. **Total Area:** The total area of a building-mounted collector array and all apparatus associated with the system shall not be larger than the square footage of or hang over the roof when attached to the roof or, when attached to a wall, be larger than the square footage of or extend beyond the building wall. A ground-mounted system on a residential property shall not exceed the total combined maximum accessory building square footage limit as specified in the zoning ordinance or 1,000 square feet, whichever is less.
- D. **Setbacks and Location:** The collector array and all other apparatus associated with a ground-mounted system shall comply with the otherwise applicable accessory building setback requirements in the zoning ordinance.
- E. **Off-site Impacts:** The collector panels and all other components of the system not within a fully enclosed building shall comply with all of the following requirements:
 - 1. All components of the system not fully enclosed within a building shall be designed and maintained with an anti-reflective surface material.
 - 2. All components shall be designed and operated to not direct glare onto any adjoining property or any public road or other public way.
 - 3. The system shall not be illuminated or have lighting of any kind.
 - 4. Lettering, company insignia, advertising, or graphics of any kind shall not be displayed on any part of the system, except such non-obtrusive lettering and/or insignia intended to identify the manufacturer and not visible from any adjoining property or adjoining public road or other public way.
 - 5. The area within which a ground-mounted system is located shall not be paved with asphalt/concrete or any other surface material that is impermeable. This shall not apply to a ground-mounted system located on brownfield land or on an existing paved area such as a former building slab or in an unused parking area where adequate parking remains for the principal use. All surface water runoff from the site shall be effectively managed on-site.
- F. **Installation and Operational Safety:** The system shall comply with all of the following requirements:
 - 1. The system shall be installed, maintained, and used in accordance with manufacturer's directions. If the system will include any batteries for electricity storage, the location of the batteries shall be disclosed to and approved in writing by the Fire Chief and filed with the Building Permit application for the system. Battery storage shall be designed, located, and maintained so as to comply with all applicable codes and regulations.
 - 2. The system shall not be made operational until the Building Official has issued a Certificate of Occupancy upon determining that the completed system installation complies with all applicable Construction Code requirements.

- G. Removal: The system, including all structural support components, shall be dismantled and removed when the system is no longer functional due to age, abandonment, or other cause. All removed components of the system intended for disposal shall be disposed of off-site in accordance with all applicable laws and regulations.

2. Wind Energy Systems, Private Accessory

- A. Setbacks: Setback distance shall be measured from the stated location below to the center of the base of the wind tower as follows:
1. Occupied community buildings and residences on non-participating properties: A horizontal distance equal to 2.1 times the maximum blade tip height from the nearest point on the outside wall of the structure.
 2. Residences and other structures on participating properties: A horizontal distance equal to 1.1 times the maximum blade tip height from the nearest point on the outside wall of the structure.
 3. Non-participating property lines: A horizontal distance equal to 1.1 times the maximum blade tip height from the property line;
 4. Public road right-of-way: A horizontal distance equal to 1.1 times the maximum blade tip height from the center line of the public road right-of-way;
 5. Overhead communication and electric transmission, not including utility service lines to individual houses or outbuildings: A horizontal distance equal to 1.1 times the maximum blade tip height from the center line of the easement containing the overhead line.
- B. Height: The system may be mounted on a building and/or may be ground mounted.
1. The height of a building-mounted system on a principal building or accessory building shall not exceed the applicable height limit for the district. A wall-mounted system on a principal building or accessory building shall not exceed the applicable roof height limit for the district, as specified in the ordinance for the district, as applicable.
 2. The height of a ground-mounted system shall not exceed 60 feet above natural grade.
- C. Roof Placement: A roof-mounted system shall be placed on the roof in compliance with requirements imposed by the applicable Construction Code.
- D. Ground Clearance: On freestanding systems, the rotor shall be located on the tower or support such that the minimum blade clearance above ground level is 20 feet.
- E. Sound: The sound pressure level generated by the system shall not exceed 30 dBA (Leq (1-hour)) measured at the nearest point on the outer wall of the nearest dwelling of an adjacent non-participating lot. Decibel modeling shall use the A-weighted scale as designed by the American National Standards Institute.
- F. Lighting: The system shall be equipped with light-mitigating technology.
- G. Wiring: All wiring between the system and the main use or electrical grid shall be underground.

- H. The system shall not display lettering, company insignia, advertising, or graphics of any kind on any part of the system, except such non-obtrusive lettering and/or insignia intended to identify the manufacturer, which shall not be visible from any adjoining property or adjoining public road or other public way.

3. Energy Storage System, Private Accessory.

- A. Coverage: Lot coverage shall not exceed the otherwise permissible percentage of lot coverage in the applicable district, as specified in Section 50.
- B. Setbacks: All energy storage system structures and related structural apparatus not physically attached to a building shall satisfy the setback requirements in the applicable district, as specified in Section 50.
- C. Lettering, company insignia, advertising, or graphics of any kind shall not be displayed on any part of the system, except such non-obtrusive lettering and/or insignia intended to identify the manufacturer and not visible from any adjoining property or adjoining public road or other public way.
- D. Installation and Operational Safety: The system shall comply with all of the following requirements:
 - 1. On-Site battery energy storage with an aggregate energy capacity of more than 600 kWh are subject to additional regulations in the applicable fire code, UL 9540, and required documentation shall be submitted along with the building/electrical permit applications.
 - 2. The system shall be installed, maintained, and used in accordance with manufacturer's directions. If the system will include any batteries for electricity storage, the location of the batteries shall be disclosed to and approved in writing by the Oshtemo Township Fire Chief and filed with the Building Permit application for the system. Battery storage shall be designed, located, and maintained so as to comply with all applicable codes and regulations.
 - 3. The system shall not be made operational until the Building Official has issued a Certificate of Occupancy upon determining that the completed system installation complies with all applicable Code requirements.
- E. Removal: The system, including all structural support components, shall be dismantled and removed when the system is no longer functional due to age, abandonment, or other cause.

Notes:

- 1) *Delete Section 60 which addresses solar energy systems to incorporate them with these amendments.*
- 2) *Eliminate references to WECS throughout all the districts.*
- 3) *Determine which districts to allow the different Principal Use Energy System as a Special Use. Private accessory systems will be allowed in all districts.*

Appendix A

Sound Report Requirements

1.0 PRECONSTRUCTION SUBMISSION REQUIREMENTS

All sound studies shall be completed by or under the direction of a qualified noise control engineer. The preferred qualification is Board Certification through the Institute of Noise Control Engineering (INCE). If the preparer is not Board Certified, then qualifications shall be justified and submitted with the application. A professional engineering license alone is not sufficient qualification to prepare the preconstruction or postconstruction noise studies.

The purpose of the preconstruction sound report is to provide the Planning Commission with information necessary to assess whether the facility will meet the noise limits defined in Sections 49.290.D.1,G, 49.290.D.2.C, or 49.490.D.3.H for proposed energy system type.

1.1 Sound modeling

1.1.1 Modeling Parameters

Sound modeling shall be conducted following the requirements of ISO 9613-2 (2024), “Engineering method for the prediction of sound pressure levels outdoors.”

For modeling wind turbine sound, ANSI/ACP 111-1 (2022), “Wind Turbine Sound Modeling,” and Annex D of ISO 9613-2 (2024) provide additional guidance for the calculation of sound pressure levels from wind turbines. Where any ambiguity exists, the parameters in Table 1 must be used.

Table 1
Sound Modeling Parameters

PARAMETER	VALUE
G (Ground factor)	0.0 over water and large areas of hard ground, 0.5 everywhere else
Modeling uncertainty adjustment	Minimum of +2 dB for wind projects, Minimum of +0 dB for all other sources
Receptor/grid height	4.0 m for wind projects, otherwise, • 4.0 m for two- or more-story dwellings (default) • If sound barriers are proposed, the height of the highest window for each dwelling

	1.5 m for property boundaries and one-story dwellings
Source height	For wind turbines, hub height. For all other sources, top of the sound source.
Receptors	All dwellings within 1 mile of any facility sound source
Temperature/Humidity	82°F, 90%
Sound power level	See below
Source directivity	For wind turbines, omnidirectional. For all other sources, directionality of sound power may be considered, if known.
Cmet (meteorological adjustment)	0 (none)
Include all sources within	5 miles
Dense vegetation	No foliage attenuation allowed to be considered outside of Project-controlled parcels
Tonal prominence	+ 5 dB tonal penalty to source sound power. The tonal penalty can be removed if it can be shown that the facility would not have a tonal prominence at a dwelling when the measured background sound of the lowest hourly L90 is added.
Façade pressure doubling^[1]	+6 dB to modeled free field outer wall sound pressure level
Other energy facilities	Other energy facilities that have an application submitted prior to this facility, approved, or built, within two miles of the facility must be included in a separate cumulative impact model run.

1.1.2 Source Sound Power

The sound power level of equipment shall be based on the following in this order of preference:

- a. Data from the manufacturer, such as those based on IEC 61400-11 or IEC TS 61400-14 for wind turbines, or similar standards used for other equipment. For wind turbines, the maximum “apparent” sound power at any wind speed must be used. For other equipment, the maximum sound power of any applicable operational mode must be used. For example, for a solar project, the inverters would be assumed to be operating at full power and the substation transformer fans would be operating. For an energy storage facility, the higher of the charging or discharging sound emissions would be used. If an energy storage project is coupled with a solar project, then both daytime and nighttime scenarios should be modeled to assess the worst case.
- b. If manufacturer data is not available, then tests of the same or similar equipment can be used, or standards for the piece of equipment can be used, such as NEMA TR-1 which specifies the maximum sound emissions for liquid-immersed transformers.
- c. If sound power data are otherwise not available, the published sound power levels for similar equipment can be used. The applicant must demonstrate that the equipment proposed to be used is substantially similar.
- d. If none of these are available, the application must justify and explain the alternative method to determine sound power.

Some manufacturers only provide a sound pressure level at a certain distance, rather than a sound power level. Care should be taken in converting this to a sound power level, especially with larger devices such as transformers and central inverters. Standards such as IEEE C57.12.90 or an applicable selection from the ISO 3740 series (such as ISO 3744 or ISO 3746) should be used to take into account the measurement area around the source.

1.2 Sound Monitoring

1.2.1 Purpose

Preconstruction sound monitoring provides an understanding of potential noise impacts on the existing soundscape prior to development of an energy system. The purpose of preconstruction sound monitoring is to determine the existing character of the area that is being considered for construction of an energy system. The sound monitoring should generally follow the requirements of ANSI S12.18 and ANSI S12.9 Part 3, where applicable.

1.2.2 Equipment

Sound level meters shall meet the ANSI/IEC Class 1 performance requirements (i.e., IEC 61672-1 and ANSI S1.4 Part 1) and log 1/3 octave band equivalent sound pressure levels. The microphone shall be protected by a 7-inch diameter hydrophobic windscreen or equivalent. If possible, sound level meters should be coupled with audio recorders to aid in sound source identification and soundscape characterization.

Each sound level meter shall be field calibrated with an acoustical calibrator meeting the requirements of IEC 60942 Class 1 immediately before and after each monitoring period. Any calibration drift above 0.5 dB will be noted and addressed with respect to ANSI S12.18. Each sound level meter and field calibrator shall have been calibrated within two years and one year, respectively, of the completion of monitoring by a National Institute of Standards and Technology traceable facility.

Anemometers must be located adjacent to each monitoring station at microphone height to measure wind speed.

1.2.3 Siting

At least two sound monitors shall be sited representative of the nonparticipating residential receptors with the highest modeled sound levels from the future facility. Preconstruction monitoring locations should be analogous to and applicable for the postconstruction study. Projects covering larger areas with more than two soundscape types should monitor at additional locations.

The monitor locations shall be outdoors and acoustically representative of a nearby residence. Specifically, monitoring equipment shall, to the extent practically possible, be placed at a similar distance from prominent soundscape sources such as roadways, heavy vegetation, and stationary equipment. The microphone shall either be façade mounted or in the free-field at least 25 feet from any building, and approximately 1.2 m to 1.5 m above ground level.

1.2.4 Data Collection and Analysis

The target sound level metric and averaging time for assessment of noise compliance are the one-hour equivalent continuous level (L_{1h}). Sound levels shall be logged at a finer interval than one-hour to provide the fidelity to enable source characterization through 1/3 octave band spectrograms and the calculation of statistical sound levels over the course of an hour, i.e. 10th percentile (L₁₀), median (L₅₀), and 90th percentile (L₉₀) sound levels. To this end, 1/3 octave band data should be logged at least once per minute; a one-second measurement interval is preferred.

1.2.4.1 Data Exclusions

To ensure an acoustically valid dataset, periods during which any of the following conditions occur shall be excluded from analysis:

- **High wind gusts** – Ground-level wind gust speeds above 5 m/s (11.2 mph).

- **Precipitation** – Snow, rain, and thunderstorm events identified through regional data and inspection of acoustic data.
- **Anomalies** – The presence of short-term contaminating sound caused by human or other activity that is atypical of the site or directly attributable to the presence of the equipment.
- Temperature or humidity outside the specification of the sound level meter or microphone.

If more than half of a one-hour aggregation period was not acoustically valid, (due to high winds or precipitation, for example), the entire one-hour period should be excluded from the analysis.

1.2.4.2 Biogenic Sound

Biogenic sounds (particularly insects, birds, and amphibians) are typically tonal and can have a pronounced effect on overall A-weighted sound levels. If biogenic sounds are a dominant aspect of the soundscape during monitoring, their influence on overall sound level should be quantified.

The “ANS” frequency-weighting (ANSI/ASA S12.100) should be applied to spectral sound levels to filter out high-frequency biogenic sound. ANS filters out sound above the 1 kHz octave band. Ideally, ANS weighting should only be used when tonal sounds, indicative of seasonal biogenic sound, are detected.

When the effect of biogenic sound is significant, that is, the overall A-weighted sound level is at least 3 dB greater than the ANS-weighted sound level, then both A-weighted and ANS-weighted sound level results shall be reported.

1.3 Monitoring and Modeling Documentation to submit

A preconstruction noise assessment study shall include, but is not limited to, the following:

- 1) Facility Description
- 2) Maps and descriptions of sources and monitoring locations, including the distance from each to the nearest facility equipment.
- 3) Sound Modeling Results
 - a. Model configuration and inputs
 - b. Sound power level source data (by 1/1 or 1/3 octave band, if available)
 - c. Tonality assessment for each source
 - d. Maps of sound level isolines depicting the maximum one-hour equivalent sound level contributions to the surrounding area

- e. Table of sound level representing the maximum facility one-hour equivalent sound level at the walls of each dwelling within 1 mile of the facility.

4) Sound Monitoring Results

- a. Narrative description of the soundscape, i.e., diurnal fluctuations, common sources of sounds, anthropogenic vs. biogenic sounds, etc.
- b. Summary of overall day and night A-weighted sound level metrics (Leq, L10, L50, and L90).
- c. Overall A-weighted time history sound levels (one-hour Leq, L10, L50, L90) and meteorological data at the monitoring stations
- d. ANS weighted results for the above, if substantive biogenic sound is found.
- e. A comparison of modeled sound levels to the existing background sound.

- 5) Discussion – An assessment of the facility's noise impacts and ability to meet the MCL 460.1226 noise limits, including a detailed description of all noise mitigation used or required to meet the noise limits.

1.4 Postconstruction Sound Monitoring Protocol

Postconstruction Sound Monitoring Protocol - A Protocol shall be developed by the applicant for conducting postconstruction sound monitoring. The sound monitoring should generally follow the requirements of Section 1.2. The Protocol shall include details on:

1. Timing
2. Monitoring locations (maps of locations, wall-mounting or free field, etc.)
3. Equipment setup (sound level meter types, calibration methods, windscreens, etc.)
4. Data collection (including logging intervals, meteorological and operational criteria for valid periods, minimum number of valid periods, background measurements, etc.)
5. Data analysis (including background correction methods, data scrubbing methods, tonality assessments, etc.)
6. Reporting
7. Noise complaint response and resolution, detailing under what circumstances postconstruction sound monitoring would be conducted and how postconstruction monitoring would be done.

1.5 Other documentation

Upon the request of the Township Clerk, sound modeling files and sound monitoring results shall be submitted in electronic format. Files with trade secrets or otherwise confidential information may be submitted under a confidential protective order.

2.0 POSTCONSTRUCTION SOUND MONITORING

2.1 Purpose

Postconstruction sound monitoring of the facility will be conducted to assess whether sound levels from the as-built facility meet the noise limits defined in this ordinance. Sound monitoring should generally follow the requirements of IEC TC 61400-11-2 (for wind projects) and ANSI S12.9 Part 3, as applicable. Postconstruction sound monitoring shall be conducted in the first year after the facility is constructed, unless otherwise directed by the Planning Commission.

2.2 Monitoring Guidelines

The noise limit for energy facilities, as defined in MCL 460.1226, is 55 dBA L1h refers specifically to facility-produced sound. To ensure that facility operation is assessed in a variety of conditions, including those associated with maximum sound emissions from the facility, unattended long-term monitoring (at least seven to 10 days) should be completed, or until sufficient valid periods are obtained, as defined in the Protocol, whichever is later. Other potential avenues for demonstrating noise compliance with MCL 460.1226 are provided in Section 2.3.

2.2.1 Equipment

Sound level meters shall meet the ANSI/IEC Class 1 performance requirements (i.e., IEC 61672-1 and ANSI S1.4) and log 1/3 octave band equivalent sound pressure levels. The microphone shall be protected by a 7-inch diameter or equivalent hydrophobic windscreen. Sound level meters should be coupled with audio recorders to aid in sound source identification and soundscape characterization. Audio recordings may be triggered by higher measured sound levels. If triggering is used, sound levels above 44 dBA should trigger recordings. Lower trigger levels may also be used.

Each sound level meter shall be field calibrated with an acoustical calibrator meeting the requirements of IEC 60942 Class 1 immediately before and after each monitoring period. Any calibration drift above 0.5 dB will be noted and addressed with respect to ANSI S12.18. Each sound level meter and calibrator shall have been calibrated within two years/one year, respectively, of the completion of monitoring, by a National Institute of Standards and Technology traceable facility.

Anemometers must be located adjacent to the monitoring station at microphone height to measure wind speed.

Additional meteorological data can be obtained from nearby National Weather Service station and/or facility logging systems.

2.2.2 Siting

Monitors should be sited at representative locations for the two nonparticipating dwellings with the highest modeled sound level.

Additional monitors for residences with formal noise complaints regarding facility operation should also have monitoring equipment deployed. Up to three additional sound monitoring locations will be identified for monitoring, representing areas where any noise complaints were received. If more than three locations received complaints, then three will be selected based on the modeled sound levels of each location and how well a site can represent other complaint locations.^[2] Consideration of whether monitoring will be done at a location will also be based on:

- The type of complaint (outdoor or indoor noise, tones, low frequency noise, amplitude modulation, vibrations, rumbles, rattles, etc., if available).
- Whether the complaint was due to a continuing operational issue or a non-recurring event.
- Whether the modeled free-field sound level is above 44 dBA (or dwelling wall is above 50 dBA).
- Whether the landowner cooperates with the study.

For facilities with centrally located equipment, like an energy storage facility or an isolated wind turbine, a “source” monitor, placed near the sound emitting equipment, can be utilized to correlate sound levels from the source.

Sound level meter microphones shall be placed outside, approximately 1.2 m to 1.5 m above the ground. The microphone shall not be placed such that any structure blocks the line of sight between the microphone and otherwise visible facility components nor in such a way that it is representative of the noise exposure at the monitoring location. A location on the nearest vertical surface of the residence can be utilized or, more commonly, a location in the free-field at least 25 feet from any building façade or other large reflective objects. If a free-field location is chosen, then 6 dB must be added to the results to account for the pressure doubling at the wall of the dwelling.

Monitoring equipment should not be placed within dense vegetation and should be away from other contributing sources of transient and consistent sound (e.g., heating systems, roadways, stationary farm equipment).

If site access is denied by a landowner to measure near or on the dwelling, the sound monitor may be sited at the closest property line at the same or similar modeled sound isoline as the dwelling. If a location with a similar sound level cannot be obtained, then an additional sound level correction shall be extrapolated to the dwelling through use of sound propagation modeling.

The one-hour equivalent average (L1h) is the target sound level metric and averaging time for assessment of noise compliance. Sound levels shall be logged at a finer interval than one-hour to

provide the fidelity to enable source characterization through 1/3 octave band spectrograms and the calculation of statistical sound levels over the course of an hour, i.e. 10th percentile (L10), median (L50), and lower 10th percentile (L90) sound levels. To this end, 1/3 octave band data should be logged at least once per minute; a one-second measurement interval is preferred.

Project operation logs (SCADA) and sound levels shall be collected to categorize operational states of the facility. If necessary, confidential facility operational data can be submitted to the Township under a confidential protective order.

2.2.3 Data Processing and Analysis

2.2.3.1 Data Exclusions

To ensure an acoustically valid dataset, periods during which any of the following conditions occur shall be excluded from analysis:

- High wind gusts – ground-level wind gust speeds above 5 m/s (11.2 mph).
- Precipitation – snow, rain, and thunderstorm events identified through regional data and inspection of acoustic data.
- Anomalies – The presence of short-term contaminating sound caused by human or other activity that is atypical of the site or directly attributable to the presence of the equipment.
- Temperature or humidity outside the specification of the sound level meter or microphone.

If more than half of a one-hour aggregation period was not acoustically valid, (due to high winds or precipitation, for example), the entire one-hour period should be excluded from the analysis (ANSI S12.9 Part 3).

2.2.3.2 Biogenic Sound

Sound level data containing notable biogenic sound should be treated carefully and noted in the narrative description of the monitoring site and results.

Solar Energy and Energy Storage may contribute sound at frequencies above the 1 kHz octave band. Therefore, additional care should be taken when monitoring the sound of these facilities, including scheduling postconstruction monitoring during periods where insects and other biogenic sounds are less prominent, such as late fall through early spring.

Wind Energy facility contribution of sound above the 1 kHz octave band (the sound spectrum of most biogenic sound) is typically negligible. Thus, sound monitoring for wind facilities may be conducted at any time. However, wind turbine power output, and thus sound output, tends to be highest in the late fall through early spring.

2.2.3.3 Anthropogenic Electromagnetic Fields and Sound

The sound report must speak to anthropogenic electromagnetic fields (EMF) and anthropogenic sounds detectable by animals which may or may not be detected by humans that will negatively impact wildlife and then propose mitigation.

2.2.3.4 Tonality

A prominent discrete tone is assessed by comparing the total sound level in a given 1/3 octave band to the adjacent 1/3 octave bands for each minute. The difference between the 1/3 octave band sound level is compared to the arithmetic average of the sound levels in the adjacent 1/3 octave bands. If the difference is greater than the values listed below, a prominent discrete tone is present.

- 15 dB at low frequencies (1/3 octave band center frequencies 25 Hz to 125 Hz).
- 8 dB at middle-frequency bands (1/3 octave band center frequencies 160 to 400 Hz).
- 5 dB at high-frequency bands (1/3 octave band center frequencies 500 to 10,000 Hz).

Any one-minute period with prominent discrete tones shall have a tonal penalty of 5 dB applied to the data if the tone is audible.

2.3 Facility Sound Level Analysis

2.3.1 General Procedures

In general, sound levels attributable to the facility ("facility sound") can be determined by an operational shutdown-based methodology. Facility sound shall be calculated from the total (facility+ background) sound by quantifying the background sound immediately before or after a period of facility operation at the same location. The sound level attributed to facility operations shall be determined by subtracting, on an energy basis, the background sound level from the total sound level, by 1/3 octave band, consistent with ANSI S12.9 Part 3 Section 7.

The results for any free field monitoring locations shall have 6 dB added to account for the pressure doubling that would have been measured had the measurement been taken at the outer wall of the dwelling.

In some cases, long-term monitoring or facility shutdowns may not be practical due to operational characteristics or restrictions and alternatives to determine compliance with this Ordinance are necessary.

- Short-term monitoring under worst-case meteorological and operational conditions where total free field sound levels are below 44 dBA (55 dBA noise limit with 5 dB tonality and the

6 dB façade correction) for at least three one-hour periods. No tonal or background corrections are necessary, or

- Measurements of individual sources to confirm manufacturer specifications and modeling inputs (e.g. 70 dBA at 1 meter or sound power using IEEE C57.12.90 or the applicable method in the ISO 3740 series), or
- Other methods consistent with ASA/ANSI S12.9 Part 3.

2.3.2 Special Procedures for Wind Energy

To the extent possible, the assessment of wind turbine noise should conform to IEC TS 61400-11-2. The recommended application of the technical standard in Michigan includes practical simplifications to alleviate specialized equipment and high-fidelity SCADA data.

2.3.2.1 Equipment, Siting, and Deployment

Monitors for assessment of wind turbines should either be mounted directly on wall or be at least 25 feet from any vertical reflecting surfaces, if possible, to minimize reflections from a façade. If the wall mount is not used, a +6 dB correction shall be applied to the resulting facility only sound levels.

2.3.2.2 Determination of Facility Sound

The method described herein applies the filtering method similar to that presented in IEC TS 61400-11-2. It includes scheduled nighttime wind turbine shutdowns to allow for the subtraction of background sound levels.

Maximum wind turbine sound shall be assessed at night. During nighttime hours, background sound (particularly anthropogenic and avian activity) is typically lowest and meteorological conditions for robust propagation of sound are most common.

All wind turbines within 1.5 miles of a monitor location shall be shut down four to eight times per night for 20 minutes at a time. One-hour periods of wind turbine operation before and after each shutdown shall be evaluated in 10-minute^[3] intervals.

From logged data for each monitor, each 10-minute period is aggregated to determine the following:

- Overall A-weighted Leq.
- 1/3 octave band Leq.
- Maximum wind gust near the ground.
- Average wind speed near the ground.
- Wind direction^[4].

- Hub-height wind speed^[5].
- Wind turbine power production^[6].
- Facility operational state (e.g., ON or OFF).

To qualify as a potential measurement of the maximum facility sound, the hour adjacent to a shutdown shall have at least half of the 10-minute periods meeting the target evaluation criteria to be “valid”:

- Data is acoustically valid (i.e. at least half not excluded for wind gusts, precipitation, anomalies).
- Wind turbines within 1.5 miles are operating at or within 1 dB of their maximum sound power output, expressed as an arithmetic average of those wind turbines.
- Average wind speed at microphone level is below 4 m/s and one minute wind gusts are below 5 m/s.
- The wind direction is either ± 45 degrees downwind relative to the closest wind turbines or within ± 45 degrees of the prevailing wind direction.

The total L1h is calculated from no less than three valid 10-minute periods in the hour. The background sound level temporally adjacent shall then be logarithmically subtracted, on a 1/3 octave band basis, from the L1h during operation, as described at the beginning of this section (ANSI S12.9 Part 3 Section 7) to determine the facility L1h.

At least three valid facility L1h periods must be collected. The highest facility L1h shall be used for comparison to the MI MCL 450.1226 noise limit.

2.3.2.3 Other Details

Since the Leq is the metric of interest, ensuring that sound level data is free from anomalous and transient data during the target evaluation periods is critical to ensuring the accuracy of the study. Anomalous data shall be excluded from background and turbine operation periods.

The temporal filtering method assumes that wind speeds do not substantively change in the 20 minutes the facility is shut down. This can be confirmed qualitatively by comparing the turbine power production prior to the shutdown to the power production afterward. Alternatively, ground wind speeds measured at each monitor can be evaluated. If they are sufficiently similar, the background period can be assumed to be representative of the background conditions during the adjacent one-hour turbine operational periods. Otherwise, the one-hour periods around the background measurement cannot be used to calculate the facility L1h.

If substation noise from a wind project is the subject of a noise complaint, then the substation sound would be measured in accordance with the General Procedures of Section 2.3.

2.4 Documentation to Submit

A sound monitoring report shall be submitted within 60 calendar days of end of the field data collection.

Sound monitoring reports must include a facility site map identifying relevant project components and nearby features of interest, including the nearest dwellings and monitor locations.

For each monitoring location, the following information will be reported:

- a. Identification of monitoring locations with pictures and on a map.
- b. Narrative of monitoring results - soundscape characteristics and effects of site conditions on measurements as derived from site visits and monitored data, as well as any significant features of the data or the monitoring period, such as the presence of biogenic sound.
- c. Time history results
 1. Overall A-weighted hourly sound level time histories for L10min and L1h. The one-hour L90, L50, and L10 sound level metrics can also be included.
 2. Ground-level wind speed and rainfall.
 3. Facility operational data (power output and shutdown dates/times if used).
- d. Details for each compliance measurement period. For measurement methodologies that involve sound source shutdowns to establish the background sound levels, the compliance measurement period would be from one hour before the shutdown to one hour after the shutdown. Otherwise, the compliance measurement periods would consist of all valid periods under the protocol for each compliance measurement period, provide (in the report or in electronic format):
 1. 10-minute power output for individual sound sources.
 2. For wind facilities, hub height wind speed and wind direction for each wind turbine within 1.5 miles of the measurement location.
 3. Average wind speed and maximum wind gust from the monitor anemometer for each 10-minute period.
 4. Temperature and relative humidity (on site or from the nearest National Weather Service station).
 5. Unweighted 1/3 octave band and overall A-weighted sound levels for each 10-minute period.

6. Determination of whether the period is valid and, if not, the reasoning.
 7. If the period is valid, the background-corrected facility 1/3 octave band and overall A-weighted sound level for each 10-minute period and for the entire one-hour period.
- e. For wind facilities, the presence of icing as indicated through icing alarms or visual observation.

If results of the postconstruction study indicate that the facility sound levels exceed the noise limit, mitigation measures shall be detailed in the report along with a schedule of implementation.

Upon implementation of mitigation measures, the sound measurements shall be repeated under similar conditions as the exceedance(s), with the updated results submitted to the Township Clerk.

2.5 Other Documentation

Upon the request of the Township Clerk, all sound monitoring data and results shall be submitted in electronic format. If necessary, confidential data may be submitted with a confidential protective order.

3.0 Definitions, abbreviations, and references

3.1 Definitions for purposes of this Appendix.

1/3 octave band means is a commonly used subdivision of the octave scale, which divides each octave into three bands. See “octave band.”

A-weighting means adjusting the sound level spectrum to represent the sensitivity of the human ear to sounds of low to moderate level to produce a single value (in dBA) in accordance with ASA/ANSI S1.4 Part 1.

Ambient sound is the total sound level, including the sound source of interest, of a wide range of sounds located near and far.

Anthropogenic electromagnetic fields (EMF) and anthropogenic sounds means of, relating to, or resulting from the influence of human beings on nature either directly or indirectly.

Background sound means sound from typical and existing elements of a soundscape, near and far, that does not include the source of interest (i.e., non-energy facility sound).

Decibel means 10 times the logarithm (base 10) of the ratio of a value to a reference value. In the case of sound pressure levels, the value is air pressure in Pascals (Pa) squared and the reference value is 20 micro-Pascals (μPa) squared.

Dwelling means an occupied or occupiable building where residents regularly sleep

Energy facility means an energy storage facility, solar energy facility, or wind energy facility. An energy facility may be located on more than 1 parcel of property, including noncontiguous parcels, but shares a single point of interconnection to the grid.

Energy storage facility means a system that absorbs, stores, and discharges electricity. Energy storage facility does not include either of the following:

- a. Fossil fuel storage.
- b. Power-to-gas storage that directly uses fossil fuel inputs.

Equivalent continuous sound level also “time-averaged sound level” means 10 times the logarithm (base 10) of the ratio of the time-mean-square frequency-weighted sound pressure signal during a stated time interval and expressed as a decibel. The shortened form is Leq. To indicate the time interval, the shortened form can be “L” with the time subscripted as in L1h for a time period of one hour. See ASA/ANSI S1.1-2013.

Frequency means the number of times in a second one cycle of a waveform passes a fixed space. The perceived pitch of a sound is proportional to its frequency. The relationship between wavelength (l) and frequency (f) is dependent on the speed of sound (c) as $f = c / l$. The typical hearing range for young healthy individuals is roughly between frequencies of 20 Hz (1 Hertz is one cycle per second) and 20,000 Hz (also designated as 20 kHz, where 1 kHz is one thousand cycles per second). The distribution of frequencies in a sound are often referred to as spectral characteristics or a spectrum.

Free-field means an environment with negligible sound reflections.

Low frequency sound means, nominally, the 1/3 octave band frequencies between 20 Hz and 200 Hz, inclusive.

Nonparticipating property means a property that is nearby an energy facility and not a participating property.

Occupied community building means a school, place of worship, day-care facility, public library, community center, or other similar building that the applicant knows or reasonably should know is used on a regular basis as a gathering place for community members.

Octave band means a sound spectrum range whose upper frequency limit is twice its lower frequency limit (the same concept as an octave in music). The band is identified by its center frequency, as defined in ASA/ANSI S1.6-2016.

Participating property means real property that either is owned by an applicant or that is the subject of an agreement that provides for the payment by an applicant to a landowner of monetary compensation related to an energy facility regardless of whether any part of that energy facility is constructed on the property.

Inverter means a device to convert direct current (DC) power to alternating current (AC) power. It is a component of Solar Energy and Energy Storage facilities. Types include, but are not limited to, “central” and “string” inverters. In Energy Storage facilities, they are often referred to as or a component of a PCS (power conversion system).

Project means the facility that is the subject of the application to the commission that is proposed to be constructed or repowered.

SCADA means the Supervisory Control and Data Acquisition System that collects time-stamped information from field devices such as wind turbines, solar panels, inverters, transformers, and battery storage units.

Solar energy facility means a system that captures and converts solar energy into electricity, for the purpose of sale or for use in locations other than solely the solar energy facility property. Solar energy facility includes, but is not limited to, the following equipment and facilities to be constructed by an electric provider or independent power producer: photovoltaic solar panels; solar inverters; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers; poles; crossarms; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; energy storage facilities; overhead and underground control; communications and radio relay systems and telecommunications equipment; utility lines and installations; generation tie lines; solar monitoring stations; and accessory equipment and structures.

Sound power level means the level of the acoustic energy radiated from a source. It is often expressed as SWL or Lw and expressed in decibels (dB) referenced to 1 picoWatt.

Sound pressure level means the fluctuating air pressure that constitutes sound as expressed in the logarithmic scale of decibels (dB) referenced to 20 micropascals.

Tonal means that a sound that has energy concentrated in a narrow frequency range. Tonal sounds of the same overall sound level are more noticeable than broadband sound. Sounds emissions from transformers, energy storage units, and inverters are typically tonal. Although multiple procedures exist for determining tonal prominences, the methods described in ANSI S12.9 Part 3, which utilizes 1/3 octave band data to assess tonal prominence, is specified herein.

3.2 List of Acronyms and Abbreviations

ACP – American Clean Power Association

ANS – A, Natural Sounds – an A-weighted decibel that eliminates sounds at and above the 1,600 Hz 1/3 octave band.

ANSI – American National Standards Institute

ASA – Acoustical Society of America

BESS or ESS – Battery energy storage system

dBA – A-weighted decibels

dBZ – Z-weighted (unweighted) decibels

G – The portion of ground that is porous, with 0 representing hard ground and 1 representing porous ground (as defined in ISO 9613-2)

Hz – Hertz, expressed as cycles per second

IEC – the International Electrotechnical Commission

INCE - the Institute of Noise Control Engineering

ISO – the International Organization for Standardization

Leq - equivalent continuous sound pressure level

L1h – one-hour equivalent continuous sound pressure level

m – meters

m/s – meters per second

NEMA – National Electrical Manufacturers Association

3.3 Standards Referenced

The following are standards referenced in this Appendix as of the adoption date. The applicant may use this version of the standard or, if the standard is updated after adoption, the most recent version.

ASA/ANSI S1.1-2013. Acoustical Terminology

ASA/ANSI S1.4 Part 1-2014 / IEC 61672-1-2013. Electroacoustics – Sound Level Meters – Part 1: Specifications

ASA/ANSI S1.6-2016. Preferred Frequencies and Filter Band Center Frequencies for Acoustical Measurements

ASA/ANSI S12.9-2013 Part 3 (2023). Quantities and Procedures for Description and Measurement of Environmental Sound — Part 3: Short-term Measurements with an Observer Present

ASA/ANSI S12.9-2021 Part 4 (2021). Quantities and procedures for description and measurement of environmental sound — Part 4: Noise assessment and prediction of long-term community response.

ANSI/ASA S12.54-2011 / ISO 3744:2010 (2016). Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane

ANSI S12.56-2011 / ISO 3746:2010 (2016). Acoustics – Determination of sound power levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane

ANSI/ASA S12.100-2014 (2014). Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas

IEC 60942 (2017). Electroacoustics – Sound calibrators.

IEC 61400-11 (2012). Wind turbines – Part 11: Acoustic noise measurement techniques.

IEC TS 61400-14 (2005). Wind turbines – Part 14: Declaration of apparent sound power level and tonality values.

IEC TS 61400-11-2 (2024). Wind energy generation systems – Part 11-2: Acoustic noise measurement techniques – Measurement of wind turbine sound characteristics in receptor position.

IEEE C57.12.90 (2021). IEEE Standard test code for liquid-immersed distribution, power, and regulating transformers.

ISO 9613-2 (2024). Acoustics — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors.

NEMA TR 1-2013 (2019). Transformers, Step Voltage Regulators, and Reactors.

Footnotes:

^[1] When the ordinance states that the noise limit is considered “at the nearest outer wall of the nearest dwelling.” In practice, this would be measured with a microphone mounted directly on the façade, that is, flush mounted on the vertical reflecting surface of a building. The pressure doubling at the surface with respect to the free-field condition leads to a 6 dB increase in sound level and is referred to as the “6-dB position” in ANSI S12.9 Part 3. Sound modeling conducted using ISO 9613-2 does not include the +6 dB adjustment. Therefore, 6 dB must be added to the sound modeling results to reflect what would be measured at the façade.

^[2] This limit of three complaint locations only applies to the first postconstruction sound test. Complaint monitoring after this is defined in the complaint resolution process proposed in the application, and as approved by the Planning Commission.

^[3] SCADA data from wind turbines is commonly available in 10-minute intervals, which sets the maximum time interval for data aggregation. Care should be taken to understand the timestamp of SCADA and meteorological data: they are often referred to as the ending time of the aggregation period (e.g., 03:10 = 03:00 to 03:10). Rather, time intervals shall be referred to as the starting time of the interval (e.g., 03:00 = 03:00 to 03:10).

^[4] Wind direction data from the nacelle shall not be used for classifying the direction of the wind during that time when the facility is not operating.

^[5] If the facility has a nearby weather station tower that collects hub height wind speed that is not in the direct wake of a turbine, the wind speed measured by the met tower at hub height is sufficient for determining when the facility is at or near maximum sound emissions.

^[6] Normalized electric power output, i.e. the percent maximum power output of each turbine, can be used to compare turbines of different ratings together on a common axis.