AGENDA
CITY COMMISSION MEETING
WEDNESDAY, SEPTEMBER 23, 2020
ELECTRONIC

Members of the public can attend online at:
https://us02web.zoom.us/j/88470457426
OR by calling in to 1-312-626-6799 and using the Webinar ID: 884 7045 7426

Members of the public can also view the meeting online at:
https://youtu.be/gxmGO5XO07g

REGULAR MEETING 6:00 P.M.

1. CALL TO ORDER BY MAYOR
2. PLEDGE OF ALLEGIANCE
3. INVOCATION
4. ROLL CALL
5. PROCLAMATIONS / PRESENTATIONS
6. VISITORS – (Public comments for items not listed as agenda items)
7. APPROVAL OF AGENDA
8. APPROVAL OF CONSENT AGENDA (agenda on next page)
9. UNFINISHED BUSINESS
10. NEW BUSINESS
    - A. Sturgis Civic Players Variety Show – Andrew Kuk
    - B. Distributed Energy Resources Forms – John Griffith
    - C. Tree Maintenance Contracts – John Griffith
    - D. Airport Primary Runway Project Contracts – Andrew Kuk
    - E. Administrative Services Specialist Position – Holly Keyser
    - F. Fiscal Year 2019-2020 Budget Amendments – Holly Keyser
11. COMMISSIONER / STAFF COMMENTS
12. CLOSED SESSION – Purchase of Property and Pending Litigation-Hamilton-Crites Arbitration Case
13. ADJOURN

CONSENT AGENDA

8A. Action of Minutes of Previous Meetings

APPROVE the minutes from the September 9, 2020 regular meeting as presented.

8B. Pay Bills

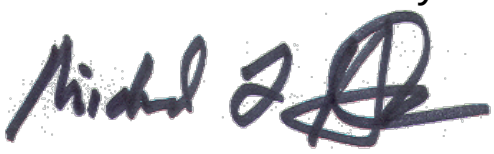
AUTHORIZE the payment of the City bills in the amount of $1,183,717.52 as presented.

Manager's Report

SEPTEMBER 23, 2020

CITY OF Sturgis MICHIGAN

Submitted by:



Michael L. Hughes
City Manager

8. Consent Agenda

Proposed Motion:
Move that the Sturgis City Commission APPROVE/DENY the Consent Agenda for September 23, 2020 as presented.

Staff Recommendation:
APPROVE

8A. Action of Minutes of Previous Meetings

Consent Agenda Motion:
APPROVE the minutes from the September 9, 2020 regular meeting as presented.

8B. Pay Bills

Consent Agenda Motion:
AUTHORIZE the payment of the City bills in the amount of $1,183,717.52 as presented.

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10. New Business

A. Sturgis Civic Players Variety Show

Staff: Andrew Kuk

The Sturgis Civic Players have submitted a request for an event "Spook – N – Follies"; this is a community variety show with a Halloween theme scheduled for either October 24th or 31st at Oaklawn Park from 5:00 pm to 7:00 pm.

The Civic Players intend to have the Sturges-Young Center for the Arts serve as a food vendor at the event and will be accepting donations from attendees. The Sturgis Civic Players are a 501c non-profit organization.

As part of their request, City staff asked that the Civic Players provide a plan for ensuring social distancing and event size limits placed by the Governor. They have included a plan that includes marking an event area, members watching the number of people in attendance, and plans to socially distance performers and attendees.

The Civic Players are requesting use of the park, sale of food in the park, and use of electricity at the space.

Proposed Motion:
Move that the Sturgis City Commission APPROVE/DENY the requests of the Sturgis Civic Players for their variety show event as presented.

Staff Recommendation:
APPROVE

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10. New Business

B. Distributed Energy Resources Forms

Staff: John Griffith

When the City began negotiating with Prism Power Partners for the solar project, Power System Engineering (PSE) was contacted to draft the initial interconnection documents that governed the details of how Prism Power Partners would connect to the City's distribution system. These initial drafts were the basis for the solar agreement.

Knowing that there would be additional solar installations, PSE was asked to update these documents for all future customer-owned generation situations. Going forward, customer and developer owned generation will be referred to as Distributed Energy Resources (DER). The documents in your packet include:

- a DER Interconnection Application Form;
- a DER Interconnection Study Agreement which provides for a study to be conducted outlining the impact of the interconnect to the City's system;
- a DER Technical Specifications Manual, which outlines technical standards for interconnection; and
- a DER Interconnection and Operating Agreement.

It is the intent of the Electric Department to use these forms as templates for future DER interconnections in order to have consistent language.

Proposed Motion:
Move that the Sturgis City Commission APPROVE/DENY the Distributed Energy Resources (DER) documents as presented.

Staff Recommendation:
APPROVE

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Included in your packet:

1. DER Interconnection Application Form
2. PSE TSM
3. DER Interconnection Study Agreement
4. DER Interconnection and Operating Agreement

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New Business

C. Tree Maintenance Contracts

Staff: John Griffith

Tree Maintenance costs for the City of Sturgis are grouped into three main areas: tree management services, line clearance for the Electric Department, and public tree maintenance for the City parks, cemeteries, and terrace areas. Contracts for all these areas run through the end of September. The City has budgeted $350,000 for line clearance services and $150,000 for public tree maintenance in FY 2020-2021. These budgets also include costs for tree management services.

Tree Management Services:
Plant Growth Management Systems (PGMS) began providing tree management services for the City in October 2014. They prioritize line clearance and street tree maintenance activities to determine the most cost effective way to trim, treat and remove trees, contact property owners, schedule the contractors, verify contractor work practices and review contractor invoices. The estimated cost for PGMS services in FY 2020-2021 is $104,000. Due to their familiarity with the City's tree system, experience, and level of service the Sturgis Electric Department is requesting to continue contracting with PGMS for 2021.

Proposed Motion:
Move that the Sturgis City Commission APPROVE/DENY the Plant Growth Management Systems Management Services Proposal for 2021 with an annual total service budget not-to-exceed one hundred and four thousand dollars ($104,000.00) as presented.

Staff Recommendation:
APPROVE

Line Clearance:
Proposals for Line Clearance were received on Tuesday, September 3, 2019. Based on the recommendation from Plant Growth Management Systems (PGMS) the City Commission awarded a line clearance contract to TreeCore. The contract contains

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language allowing two one-year extensions. The price increases for 2020-2021 are minimal and PGMS recommends executing the first one-year extension. As stated above, the total budget for line clearance in FY 2020-2021 is $350,000; of that amount, TreeCore's estimated portion is $220,000.

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY the first one year extension for Line Clearance with TreeCore, LLC with an annual total service budget not-to-exceed two hundred and twenty thousand dollars ($220,000.00) as presented.

Staff Recommendation:

APPROVE

Public Tree Maintenance:

On September 14, 2020 the City received bids for public tree maintenance from Asplundh Tree Expert Company, TreeCore and Midwest Tree Service. The contractors' price sheets are included in your packets. The bids were reviewed by Plant Growth Management Systems (PGMS). PGMS recommends awarding the contract to Asplundh Tree Expert Company. As stated above, the FY 2020-2021 budget for public tree maintenance is $150,000. Asplundh's portion is estimated to be $110,000.

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY the public tree maintenance proposal from Asplundh Tree Expert Company with an annual total service budget not-to-exceed one hundred and ten thousand dollars ($110,000.00) as presented.

Staff Recommendation:

APPROVE

Included in your packet:

1. PGMS Street Tree Recommendation
2. Sturgis ROW Services Contract

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3. TreeCore Contract 2020-21
4. Asplundh Street Tree Unit Prices
5. Midwest Street Tree Unit Prices

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New Business

D. Airport Primary Runway Project Contracts

Staff: Andrew Kuk

Included in the City Airport Capital Improvement Program for 2020 was rehabilitation of the primary airport runway.

Due to the cost of the project, funding requires a discretionary grant from the Federal Aviation Administration (FAA), not typically a part of our airport projects.

In order to apply for the discretionary grant, the City's Airport engineering consultant Mead & Hunt, along with City staff and the Michigan Department of Transportation Aeronautics (MDOT Aero) conducted bid phase work and then received bids for the project on May 15th, 2020. The sole bidder was Michigan Paving and Materials in the amount of $3,540,505.85; this was just under the engineer's estimate for the project. A bid tabulation and recommendation of award from Mead & Hunt is included in your packet.

In addition, Mead & Hunt prepared a professional services contract for construction-phase engineering on the project in the amount of $233,850.00. As is standard procedure for these grants, the amount has been reviewed by MDOT Aero for cost-reasonableness.

The bid as well as the amount of the professional services contract were included as part of the grant application to the FAA by the State of Michigan for the project. As part of the CARES Act Coronavirus relief package, all awarded 2020 FAA grant projects are 100% federally funded. In previous years the City would been responsible for 5% of the project cost; this year there is no City match cost for the project. A draft Exhibit 1 from the State of Michigan showing the budget and funding for the project is included in your packet.

The City has been told that the grant will be released for the project, but as of Friday no official announcement has been made or paperwork released. These are

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expected any day, as all necessary paperwork for the FAA needs to be completed by September 30th.

Due to the short turnaround of paperwork, City staff is asking for Commission approval to sign all necessary documents for the project, including a construction contract, professional services contract, MDOT grant agreement, and any necessary paperwork from the FAA. Authorization to sign the construction contract would be contingent upon award of the FAA discretionary grant and associated grant paperwork from MDOT Aeronautics.

While the original plan was for construction of the project to take place this year, because of the funding delay construction is being postponed until Spring 2021. Michigan Paving and Materials has been contacted and will hold their bid pricing on the project. This does not impact the 100% grant coverage of the project.

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY a construction contract with Michigan Paving and Material for the rehabilitation of Runway 1-19 in the amount of three million, five hundred and forty thousand, five hundred and five dollars and eighty-five cents ($3,540,505.85) and AUTHORIZE City Manager Michael Hughes to sign contingent upon award of a FAA discretionary grant for the project and issuance of associated grant contracts.

Staff Recommendation:

APPROVE and AUTHORIZE

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY a contract with Mead & Hunt for construction-phase engineering services in the amount of two hundred and thirty-three thousand, eight hundred and fifty dollars ($233,850.00) and AUTHORIZE City Manager Michael Hughes to sign contingent upon award of a FAA discretionary grant for the project and issuance of associated grant contracts.

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Staff Recommendation:
APPROVE and AUTHORIZE

Proposed Motion:
Move that the Sturgis City Commission APPROVE/DENY and AUTHORIZE City Manager Michael Hughes to sign all necessary documents for acceptance of grant funding for the rehabilitation of Runway 1-19, Project Number I-26-0092-2020 from the Michigan Department of Transportation Aeronautics and/or the Federal Aviation Administration.

Staff Recommendation:
APPROVE and AUTHORIZE

Included in your packet:
1. Bid Tab and Recommendation of Award
2. Draft Exhibit 1

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New Business

E. Administrative Services Specialist Position

Staff: Holly Keyser

Over the past year or more, City staff have been evaluating and making adjustments to the staffing plan for City Hall administrative services positions, including positions in Utilities Customer Service, the Clerk/Treasurer's Office, utility billing, and finance. These adjustments have been due to a number of factors including a lack of staff capacity in some functional areas, retirements, internal position changes among staff, inclusion of additional duties to existing staff and departments, succession planning, and expansion of service hours.

While several steps have been taken to address staffing issues, including the hiring of a full time Accounts Payable Clerk, further long-term administrative support for our business services is needed. City staff are proposing the hire of an Administrative Services Specialist Position that would provide administrative support in areas such as finance, accounting, human resources, and customer service to departments including the utilities, cemetery, Doyle, Sturges-Young Center for the Arts, and other business operations. This position would also work to provide coverage for other administrative positions in the City as needed.

During a time of increasing budget constraints in 2010, open hours to the public were reduced to four days per week and a reduction in workforce of two full-time positions was achieved through attrition. Over the last ten years, Tuesdays were used to maximize efficiency in the completion of certain operations such as bill production, notices, shutoff lists, and payroll processing as well as for training. These efforts allowed staff to operate at reduced staffing levels during this timeframe, although not always as effectively as possible. As stated, even with these reduced City Hall hours, additional staffing for administrative functions has been a need.

Over time, City Hall administrative functions have expanded to include cemetery administration, park shelter rentals, and compost pass distribution and sales among others. A collaborate team environment and sharing of staff has resulted

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in the ability of City Hall personnel to cover most basic questions/functions for permitting, taxes, and utilities as well as the other various services, including some administrative functions such as accounting and payroll. However, there is a limit to the amount of responsibilities that can be added given current staff levels. In response, City Hall has been fortunate to have additional part-time staffing from retirees over the years, but this is a temporary solution to a long-term problem.

These staffing issues have been further highlighted over the past six months, as staff members have retired and new, inexperienced staff are either joining the organization or learning new roles. Additionally, the reopening of City Hall to the public on Tuesdays has reduced the time for efficient completion of critical tasks, emphasizing the need for additional staff support. While in the short-term the City has used available, otherwise furloughed staff to fill in where needed, as departments continue to return to more normal operations these resources will no longer be available.

Additional considerations to justify this position include the following:

- Lack of capacity for existing accounting/finance/human resources work;
- Succession planning for future retirements;
- Expansion of absentee voting has increased the election workload considerably;
- Increased overtime for staff since reopening on Tuesday to the public to meet the deadlines for printing of bills and notices; and
- Impact to overall operations of additional requirements for COVID workplace safety.

Quantitatively, the additional capacity need can be justified as follows:

Unmet Accounting/HR/Finance Administrative Support	20 hours
Cemetery Administrative Support	16 hours
Loss of dedicated production on Tuesdays	16 hours
Loss of part-time retiree time for utility billing and misc. admin. work	8 hours

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If approved, funding for this position will be split between the clerk/treasurer and controller department in the General Fund and will be recovered across the other city funds through the administrative reimbursement formula beginning in 2022. A budget amendment is being requested for the General Fund for Fiscal Year 2020-2021 in the amount of $60,000 to cover wages and benefits for the proposed position.

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY a budget amendment of sixty-thousand ($60,000.00) in the General Fund for the Administrative Services Specialist position as presented.

Staff Recommendation:

APPROVE

Information Included in Packet:

1. Issue Analysis Report

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New Business

F. Fiscal Year 2019-2020 Budget Amendments

Staff: Holly Keyser

Included in your packet is a memo from City Controller Holly Keyser regarding final budget amendments for Fiscal Year 2019-2020, which ends September 30th. In accordance with the Uniform Budgeting and Accounting Act, governmental funds need to be amended to reflect changes in the expected revenue and operating expenditures incurred in the 2019-2020 fiscal year, as compared to those originally estimated in the approved budget as previously amended.

Proposed Motion:

Move that the Sturgis City Commission APPROVE/DENY the budget amendments for fiscal year 2019-2020 as presented.

Staff Recommendation:

APPROVE

Information Included in Packet:

1. Budget Amendment Memo

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Noteworthy Meetings / Events

- COVID-19 Updates Webinar | September 8th
- Township Supervisor's Meeting | September 9th
- St. Joseph County Brownfield Authority Board Meeting | September 10th
- City Manager's Meeting/MME Strategic Planning Meeting | September 11th
- St. Joseph County Brownfield Authority Board Meeting | September 14th
- SABEA Meeting | September 14th
- Virtual Listening Session | September 14th
- Sturges-Young Center for Arts Board Meeting | September 17th
- WBET Interview – Social Districts | September 18th

Upcoming Events

- Chamber Golf Outing | September 18th
- Summer's End | Downtown | 5:30pm-9:00pm | September 18th
- St. Joseph County United Way Radiothon | September 24th
- MML Virtual Conference | September 30th-October 2nd
- Fall Food and Cruise In | Downtown | 4:00 pm-8:00 pm | October 9th

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 8A

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REGULAR MEETING - STURGIS CITY COMMISSION
WEDNESDAY, SEPTEMBER 9, 2020
ELECTRONIC/VIRTUAL

Mayor Hile called the meeting to order at 6:00 p.m.

Assistant City Manager Andrew Kuk provided information on the City of Sturgis Electronic/Virtual Meetings Policy.

The Pledge of Allegiance was said by all present.

The Invocation was given by Scott Miller, Youth For Christ

Commissioners present: Mullins, Bir, Klinger, Wickey, Malone, Littman, Vice-Mayor Good, Mayor Hile
Commissioners absent: None

Also present: City Attorney, City Manager, Assistant City Manager, City Controller, Deputy Police Chief, DPS Director, Parks and Cemetery Superintendent, City Clerk

Moved by Comm. Littman and seconded by Comm. Mullins to approve the agenda as presented.
Voting yea: Eight **Voting nay: None** **MOTION CARRIED**

Moved by Comm. Littman and seconded by Comm. Klinger to approve the Consent Agenda of September 9, 2020 as presented.

8A. Action of Minutes of Previous Meetings
APPROVE the minutes from the August 26, 2020 regular meeting as presented.

8B. Pay Bills
AUTHORIZE the payment of the City bills in the amount of $1,336,763.37 as presented.

8C. Sale of Vehicle 3136-17 – 2017 Dodge Charger
APPROVE the sale of vehicle 3136-17, a 2017 Dodge Charger, as presented.

8D. "Summer's End" DDA Car Cruise-In Request
APPROVE the requests for the 2020 Summers End Car Cruise-In for Friday, September 18th, 2020.

8E. PA 425 Property Transfer Request – Lifecare Ambulance
ADOPT the Resolution to Transfer of Property from Sturgis Township to City of Sturgis pertaining to Sturgis Township Parcel Numbers 75-015-002-052-00 and 75-015-002-052-01.

Voting yea: Eight **Voting nay: None** **MOTION CARRIED**

There was discussion regarding the proposed cemetery rates.

Moved by Comm. Mullins and seconded by Comm. Good to approve the Cemetery Rates for Fiscal Year 2021 and Fiscal Year 2022 as presented.
Voting yea: Eight **Voting nay: None** **MOTION CARRIED**

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There was discussion regarding the development of new lots in Oak Lawn Cemetery.

Moved by Comm. Klinger and seconded by Comm. Bir to approve the development of section RR in Oak Lawn Cemetery as presented.
Voting yea: Eight **Voting nay: None** **MOTION CARRIED**

Assistant City Manager Andrew Kuk provided on the permit requests for the recently approved social district. Discussion followed.

Moved by Comm. Klinger and seconded by Comm. Bir to recommend the application from Wings of Sturgis, LLC (DBA Wings Etc.) for a Social District Permit for consideration for approval by the Michigan Liquor Control Commission for their location at 111 W. Chicago Rd.
Voting yea: Eight **Voting nay: None** **MOTION CARRIED**

Comm. Malone left the meeting

Moved by Comm. Klinger and seconded by Comm. Mullins to recommend the application from the City of Sturgis (DBA Sturges-Young Civic Auditorium) for a Social District Permit for consideration for approval by the Michigan Liquor Control Commission for their location at 201 N. Nottawa St.
Voting yea: Seven **Voting nay: None** **Absent: Malone** **MOTION CARRIED**

City Clerk/Treasurer Kenneth Rhodes explained that Gabe Alvez, Ed Dinsmore, and Steve Shevick have applied to the vacancy on the Planning Commission. Vice-Mayor Good explained that all three applicants are well qualified. Comm. Wickey nominated Gabe Alvez.

Moved by Comm. Wickey and seconded by Comm. Klinger to appoint Gabe Alvez to the Planning Commission through May 2023.
Voting yea: Seven **Voting nay: None** **Absent: Malone** **MOTION CARRIED**

City Manager Michael Hughes explained that he has been in contact with a resident and the USDA regarding an issue with turkey vultures roosting on his property and a possible solution to their presence.

The City Commission had consensus for the City to work with the USDA for a solution to this issue.

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Moved by Comm. Littman and seconded by Comm. Wickey to go into Closed Session for discussion of union negotiations.
Voting yea: Seven Voting nay: None Absent: Malone MOTION CARRIED

Meeting recessed at 7:16 p.m.
Meeting reconvened at 7:30 p.m.

Moved by Comm. Good and seconded by Comm. Klinger to approve the CBA Settlement Agreement between the City of Sturgis and POLC as presented and authorize the City Manager to sign all necessary documents.
Voting yea: Seven Voting nay: None Absent: Malone MOTION CARRIED

The meeting was adjourned at 7:33 p.m.

Kenneth D. Rhodes, City of Sturgis Clerk/Treasurer

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 8B

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Date	Check#	Vendor	Vendor Name	Amount
Manual Checks				
09-04-2020	PR0537M	00061	CITY OF STURGIS PAYROLL	258,570.51
09-24-2020	T13047M	03857	THE BANK OF NY MELLON NA	359,523.41
09-09-2020	T13048M	04088	BLUE CROSS BLUE SHIELD OF MI	8,863.23
09-28-2020	T13049M	04389	FRONTIER COMMUNICATIONS A	43.73
Automatic Checks				
09-23-2020	237987	00110	A & K PRINTING & POOLS	105.00
09-23-2020	237988	00335	ALTEC INDUSTRIES, INC.	5,087.85
09-23-2020	237989	06070	ANGEL ARMOR LLC	3,857.53
09-23-2020	237990	00296	APRIL O AND LEE HD WELLS	53.12
09-23-2020	237991	00624	AQUA BLAST CARWASH SYSTEMS INC	273.00
09-23-2020	237992	00379	AUTO PARK FORD	31.51
09-23-2020	237993	05656	AXON ENTERPRISE INC	313.75
09-23-2020	237994	04776	BARONE HARDWARE & AUTO	1,286.89
09-23-2020	237995	04292	BASIC	105.00
09-23-2020	237996	00296	BLAKE M SMITH	30.22
09-23-2020	237997	00005	BOGEN CONCRETE INC	2,543.45
09-23-2020	237998	00006	BOLAND TIRE INC	255.00
09-23-2020	237999	05634	BURR OAK TOOL, INC.	7,632.20
09-23-2020	238000	01283	BYCE & ASSOCIATES INC	1,100.00
09-23-2020	238001	05929	FACTUAL DATA	50.00
09-23-2020	238002	00315	CENTURYLINK	59.56
09-23-2020	238003	00001	CREATIVE MICROSYSTEMS INC	624.00
09-23-2020	238004	04859	COFESSCO FIRE PROTECTION LLC	197.32
09-23-2020	238005	00296	CORY W PEEKE	100.00
09-23-2020	238006	05863	COTTIN'S HARDWARE	142.25
09-23-2020	238007	00296	CRYSTAL D ASH	14.43
09-23-2020	238008	00152	CULLIGAN WATER CONDITIONING	60.00
09-23-2020	238009	00296	DAVID E CALDERON	5.11
09-23-2020	238010	01119	DAVID W LUDDERS	47.00
09-23-2020	238011	00166	ELHORN ENGINEERING CO	590.00
09-23-2020	238012	04955	ENVIRO-CLEAN	2,316.58
09-23-2020	238013	00169	FASTENAL COMPANY	58.30
09-23-2020	238014	05151	FAWN RIVER MECHANICAL LLC	3,383.53
09-23-2020	238015	05841	FERGUSON FACILITIES SUPPLY	900.04
09-23-2020	238016	05490	FERGUSON WATERWORKS #3386	5,530.50
09-23-2020	238017	00460	FITNESS THINGS INC	358.00
09-23-2020	238018	00776	FLEIS & VANDENBRINK	6,200.00
09-23-2020	238019	04389	FRONTIER COMMUNICATIONS A	62.31
09-23-2020	238020	02082	GECKO SECURITY LLC	170.00
09-23-2020	238021	04002	GENESIS LAMP CORP	204.02
09-23-2020	238022	00183	W W GRAINGER INC	545.47
09-23-2020	238023	04243	GRP ENGINEERING INC	800.00
09-23-2020	238024	04348	HAGADORN MECHANICAL SERVICES	312.21
09-23-2020	238025	03515	HYDROCORP	1,732.00
09-23-2020	238026	04814	INFOR (US) INC	3,188.40
09-23-2020	238027	05522	INTERSTATE BATTERIES-GREAT LKS	167.34
09-23-2020	238028	05171	STUART C IRBY CO	1,656.00
09-23-2020	238029	00296	JUAN BARRERA MARTINEZ	57.84
09-23-2020	238030	05973	KASTEN INSULATION SERVICES INC	1,911.00
09-23-2020	238031	00296	KATHRYN S ELLINGSON	100.00
09-23-2020	238032	00020	KENDRICK STATIONERS INC	87.48

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Date	Check#	Vendor	Vendor Name	Amount
09-23-2020	238033	03794	KLOSTERMAN DISTRIBUTING	1,010.14
09-23-2020	238034	00216	LAWSON PRODUCTS INC	115.22
09-23-2020	238035	00394	LAWSON-FISHER ASSOCIATES PC	8,887.98
09-23-2020	238036	02499	LIBERTY PROCESS EQUIPMENT INC	12,708.25
09-23-2020	238037	00220	LITHO PRINTERS INC	242.98
09-23-2020	238038	00023	LONESPRUCE	70.00
09-23-2020	238039	05813	FABIAN LOPEZ	60.00
09-23-2020	238040	00296	MARSHA WISEMAN	52.63
09-23-2020	238041	05187	ALLEN MEYER	1,000.00
09-23-2020	238042	05634	MICHAEL CLIPFELL	100.00
09-23-2020	238043	01601	STATE OF MICHIGAN	1,000.00
09-23-2020	238044	05121	MICKEY'S LINEN	51.60
09-23-2020	238045	06026	MID-CITY SUPPLY CO INC	446.00
09-23-2020	238046	05051	MILSOFT UTILITY SOLUTIONS	503.66
09-23-2020	238047	00992	MUNICIPAL CODE CORPORATION	550.00
09-23-2020	238048	05102	McLEAN ENGINEERING CO	7,739.78
09-23-2020	238049	05753	NALCO WATER PRETREATMENT	41.40
09-23-2020	238050	06069	NAPA AUTO PARTS	411.31
09-23-2020	238051	04542	NENA	255.00
09-23-2020	238052	00255	NIBLOCK EXCAVATING INC	2,468.75
09-23-2020	238053	00256	NISSLEY DISPOSAL INC	1,695.00
09-23-2020	238054	03934	OUDBIER INSTRUMENT CO	950.00
09-23-2020	238055	05671	PACE ANALYTICAL SERVICES LLC	190.50
09-23-2020	238056	04770	PARRISH EXCAVATING INC	162,953.23
09-23-2020	238057	00296	PAUL AND BRANDON PEREZ	25.22
09-23-2020	238058	02365	G PERSING INC	2,462.55
09-23-2020	238059	05042	PLANT GROWTH MANAGEMENT SYSTEM	7,080.50
09-23-2020	238060	05954	PMV CUSTOM FINISHES	1,575.00
09-23-2020	238061	00033	POSTNET POSTAL & BUSINESS	94.93
09-23-2020	238062	00485	POWER LINE SUPPLY	14,129.84
09-23-2020	238063	00031	POWER SYSTEM ENGINEERING INC.	40,714.28
09-23-2020	238064	04481	PROF SPORTS SPECIFIC TRAINING	360.00
09-23-2020	238065	05468	PVS TECHNOLOGIES INC	2,811.98
09-23-2020	238066	00537	REGULATORY COMPLIANCE SERVICES	1,355.90
09-23-2020	238067	04909	REHMANN ROBSON LLC	275.00
09-23-2020	238068	05739	RENEWABLE WORLD ENERGIES LLC	5,019.68
09-23-2020	238069	00035	RESCO	4,781.67
09-23-2020	238070	03542	RICKETT'S LAWN CARE	4,724.00
09-23-2020	238071	05371	RIVER CITY SUPPLY LLC	1,527.50
09-23-2020	238072	00296	ROBERT RUHS	712.75
09-23-2020	238073	06049	SHERMCO INDUSTRIES INC	4,791.00
09-23-2020	238074	02179	SPRINT	1,402.76
09-23-2020	238075	00296	SSNH HOLDINGS LLC	1,423.93
09-23-2020	238076	00488	STATE SYSTEMS RADIO INC	195.00
09-23-2020	238077	04274	STEENSMA LAWN & POWER EQUIP	1,348.86
09-23-2020	238078	05634	STURGIS PUBLIC SCHOOLS	11,248.77
09-23-2020	238079	00492	SUPERIOR FOODS COMPANY	390.37
09-23-2020	238080	04140	SWICK BROADCASTING COMPANY	200.00
09-23-2020	238081	02819	T & R SERVICE COMPANY	14,475.50
09-23-2020	238082	00046	TELE-RAD INC	2,338.51
09-23-2020	238083	01791	TITANIUM SOLUTIONS INC	550.00
09-23-2020	238084	05777	TRACE ANALYTICAL LABORATORIES	241.00
09-23-2020	238085	05664	TREECORE LLC	9,069.00

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Date	Check#	Vendor	Vendor Name	Amount
09-23-2020	238086	05686	TRI-STATE SECURITY LKSMITH LLC	65.00
09-23-2020	238087	01238	UNITED PARCEL SERVICE	5.92
09-23-2020	238088	06029	VAN DOORN ROOFING INC	149,940.93
09-23-2020	238089	06030	VERIZON CONNECT NWF INC	113.33
09-23-2020	238090	04453	VERIZON WIRELESS	1,625.92
09-23-2020	238091	00296	VISTA POINTE APARTMENTS LLC	52.23
09-23-2020	238092	03511	WASTE MANAGEMENT	572.65
09-23-2020	238093	01941	WESTECH ENGINEERING INC	152.88
09-23-2020	238094	02948	WITMER PUBLIC SAFETY GROUP INC	699.50
09-23-2020	238095	00296	YI CHENG KAO	39.63
09-23-2020	D01558	00002	ALL-PHASE ELECTRIC SUPPLY	2,959.60
09-23-2020	D01559	04732	ALTA EQUIPMENT COMPANY	2,782.64
09-23-2020	D01560	02983	CINTAS LOCATION #351	1,178.94
09-23-2020	D01561	00019	KENDALL ELECTRIC INC	123.75
09-23-2020	D01562	03922	MARANA GROUP	3,223.58
09-23-2020	D01563	03944	PRAXAIR DISTRIBUTION INC	46.00

Manual Total	$627,000.88
Automatic Total	$556,716.64
Grand Total	$1,183,717.52

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PAYROLL DISBURSEMENT

FOR PAYROLL ENDING August 30, 2020

PR0537M - Paid September 4, 2020

GENERAL	$128,056.64
MAJOR STREET	6,487.50
LOCAL STREET	6,430.94
CEMETERY	6,899.86
DDA	778.88
AIRPORT	100.00
BUILDING	2,678.97
STURGES-YOUNG CENTER FOR THE ARTS	4,837.63
RECREATION	2,268.67
DOYLE RECREATION CENTER	3,624.09
ELECTRIC	66,379.59
SEWER	18,195.79
WATER	9,397.24
MOTOR VEHICLE	2,434.71
Payroll Sub-Total	**$258,570.51**

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 10B

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DRAFT

Distributed Energy Resource (DER)
Interconnection Application Form

All Interconnection Customer requests to interconnect a Distributed Energy Resource (DER) with the City of Sturgis electric distribution system, must complete and submit this Interconnection Application Form to the City along with a $_____ non-refundable Processing Fee. Each proposed DER interconnection requires a separate Interconnection Application Form and Processing Fee.

Following the receipt of the Interconnection Application Form and Processing Fee, the City will determine if the application is complete. If not complete, the City will return the Interconnection Application Form to the applicant indicating which additional items are needed to process the application. Based on the proposed DER size, type, and interconnection location with the electric distribution system, the City will determine if the application will proceed to a Fast Track process or a System Impact Study process. Engineering study fees may apply.

If the Interconnection Application Form is submitted solely due to a transfer of ownership or change of control of the DER facility, the Interconnection Customer shall submit a $_____ processing fee.

I. Interconnection Customer Information

Legal Name of the Interconnection Customer (*or, if an individual, individual's name*)

Name: _____

Contact Name: _____

Title: _____

E-mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day): _____ (Evening): _____

Facility Location (*if different from above*)

Mailing Address: _____

City: _____ State: _____ Zip: _____

Alternative Contact Information/Owner/Lessor (*if different from the Interconnection Customer*)

Contact Name: _____

Title: _____

Company: _____

E-mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

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Telephone (Day): _____ (Evening): _____

Application is for:

- ☐ New DER facility
- ☐ Capacity change to a proposed or existing DER facility
- ☐ Change of ownership of a proposed or existing DER facility to a new legal entity
- ☐ Change of control of a proposed or existing DER facility of the existing legal entity

If capacity addition to an existing DER Facility, please describe: _____

_____

_____

_____

Will the Generating Facility be used for any of the following?

To supply power to the Interconnection Customer	☐ Yes	☐ No
To supply power to the City of Sturgis	☐ Yes	☐ No
To supply power to others	☐ Yes	☐ No

***STOP**: Continue with Sections II and III for a new DER facility or a capacity change to a proposed or existing DER facility. Otherwise skip to Section X.*

II. Point of Interconnection Information

Requested point of interconnect: _____

Requested in-service date:_____

For installations at locations with existing electric service to which the proposed DER Facility will interconnect, provide:

Existing account number: _____

Service address: _____

Billing Address (*if different from Service Address*):_____

III. General DER Information

Information applies only to the DER Facility, not the Interconnection Facilities.

Prime Mover:

☐ Photovoltaic (PV)	☐ Fuel Cell	☐ Reciprocating Engine
☐ Gas Turbine	☐ Steam Turbine	☐ Micro-turbine
☐ Battery	☐ Other: _____	

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Energy Source:

Renewable	Renewable	Non-Renewable
☐ Solar – Photovoltaic	☐ Hydro – Run of River	☐ Fossil Fuel – Diesel
☐ Solar – Thermal	☐ Hydro – Storage	☐ Fossil Fuel – Natural Gas
☐ Biomass – Landfill Gas	☐ Wind	☐ Fossil Fuel – Oil
☐ Biomass – Digester Gas	☐ Geothermal	☐ Fossil Fuel – Coal
☐ Biomass – Solid Waste	☐ Other/Specify	☐ Other/Specify
☐ Biomass – Wood	_____	_____

Energy Reuse

☐ Battery Storage

Type of DER: ☐ Synchronous ☐ Induction ☐ DFIG ☐ Inverter-based

Total DER nameplate output rating: _____kW-AC _____kW-DC _____kVAR

Is the DER facility package certified? ☐ Yes ☐ No

List components of the DER Facility equipment package that are currently certified:

	Quantity	Equipment Type	Certification
1.			
2.			
3.			
4.			
5.			

***STOP**: Continue with Sections IV through IX for a DER facility package that is not UL-1741 certified or has a nameplate output rating greater than 40 kW. Otherwise skip to Section X.*

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IV. Load and Export Information

Interconnection Customer or customer-side peak load: _____kW-AC (*state if none*)

Interconnection Customer or customer-side minimum load: _____kW-AC (*state if none*)

Interconnection Customer DER auxiliary load: _____kW-AC (*state if none*)

Expected reactive load (*if known*):_____kVAR

Maximum export capabilities requested: _____kW-AC

V. Inverter-Based Solar Facility Characteristics (*if applicable*)

Solar Panel Information

	Quantity	Manufacturer	Model
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

Individual Photovoltaic Panel

Current at maximum power point (I_{mpp}): _____ Amps

Voltage at maximum power point (V_{mpp}): _____ Volts

Short-circuit current in standard test conditions (I_{sc}): _____ Amps

Open-circuit voltage in standard test conditions (V_{oc}): _____ Volts

Short-circuit current temperature coefficient (α_{sct}): _____ %/°C

Open-circuit voltage temperature coefficient (β_{oct}): _____ %/°C

Normal operating cell temperature (NOCT): ____ °C

Reference ambient temperature (T_a ref): ____ °C

Standard test condition temperature (T_{stc}): _____ °C

Standard test condition irradiance (G_{stc}): _____ W/m^2

Total Photovoltaic Array

☐ Fixed Tilt Array ☐ Single Axis Tracking Array ☐ Double Axis Tracking Array

Number of photovoltaic panels in series (N_s): _____

Number of photo voltaic panels in parallel (N_p): _____

DC voltage of array: _____ Volts-DC

Rated power of array: _____ kW-DC

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Inverter Information

Quantity	Manufacturer	Model	Standard
_____	_____	_____	_____

☐ Single-phase ☐ Three-phase

☐ Line-commutated ☐ Self-commutated

Efficiency: _____%

Internal losses: _____W

AC side inverter rating: _____ kVA

AC side active power rating: _____ kW

AC side reactive power rating: _____ kVAR

AC side minimum power factor rating: +/-_____ %

Short-circuit fault contribution: _____A

Harmonic content: _____

DC side rated voltage (Vdc): ____ Volts

DC side capacitor (Cdc): ☐ No ☐ Yes _____ μF

Internal Coupling Element: ☐ No ☐ Yes

Internal coupling resistance (R): _____ Ω

Internal coupling inductance (L): _____ H

VI. Inverter-Based Battery Energy Storage Characteristics (*if applicable*)

Battery Module and Battery Management System

Rated Storage Energy: _____ kWh

Maximum Charging Power: _____ kW

Maximum Discharging Power: _____ kW

Charge Efficiency (DC Side): _____ %

Discharge Efficiency (DC Side): _____ %

Idling Active Losses: _____W

Idling Active Losses: _____var

Energy Storage Controls:

☐ No Monitoring	☐ Volt-Var	☐ Max Generation Level
☐ Power Monitoring	☐ Volt-Watt	☐ Max Charging Level
☐ DER Monitoring	☐ Watt-Power Factor	☐ Adjust Power Factor

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Summary of control mode and properties on how the battery will be charged and discharged:

_____

_____

Inverter Information

Quantity	Manufacturer	Model	Standard
_____	_____	_____	_____

☐ Single-phase ☐ Three-phase

☐ Line-commutated ☐ Self-commutated

Efficiency: _____%

Internal losses: _____W

AC side inverter rating: _____ kVA

AC side active power rating: _____ kW

AC side reactive power rating: _____ kVAR

AC side minimum power factor rating: +/-_____ %

Short-circuit fault contribution: _____A

Harmonic content: _____

DC side rated voltage (Vdc): ____ Volts

DC side capacitor (Cdc): ☐ No ☐ Yes _____ μF

Internal Coupling Element: ☐ No ☐ Yes

Internal coupling resistance (R): _____ Ω

Internal coupling inductance (L): _____ H

VII. Rotating Machine Facility Characteristics (*if applicable*)

Synchronous Machines

Equivalent MVA base: _____MVA

Field voltage: _____Volts

Field amperage: _____Amps

Direct axis synchronous reactance, X_d: _____p.u.

Direct axis transient reactance, $X'_{d:}$ _____p.u.

Direct axis subtransient reactance, X''_d: _____p.u.

Negative sequence reactance, X_2: _____p.u.

Zero sequence reactance, X_0: _____p.u.

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Induction Machines

Motoring power: _____ kW

Equivalent MVA base: _____MVA

I^2t or K (Heating time constant): _____

Rotor resistance, R_r: _____p.u.

Stator resistance, R_s: _____p.u.

Rotor reactance, X_r: _____p.u.

Stator reactance, X_s: _____p.u.

Magnetizing reactance, X_m: _____p.u.

Short current reactance, X_d: _____p.u.

Exciting current: _____ Amps

Required reactive power (No load): _____ kVAR

Required reactive power (Full Load): _____kVAR

Total rotating inertia, H: _____ p.u.

VIII. Interconnection Facilities Information *(if applicable)*

Will more than one transformer be used between the DER and the point of common coupling?

☐ Yes ☐ No

(If yes, provide the below information for each transformer. The number of transformers must match the one-line diagram and transformer specification sheets.)

Will the transformer be provided by the Interconnection Customer? ☐ Yes ☐ No

Transformer Data (*if supplied and Owned by Interconnection Customer*)

☐ Single-Phase ☐ Three-Phase

Size: _____ kVA

Impedance: _____ %

For three-phase transformers:

Primary Winding Voltage: ___ Volts

☐ Delta ☐ Wye, grounded neutral (City Standard) ☐ Wye, floating neutral

Secondary Winding Voltage: ___ Volts

☐ Delta ☐ Wye, grounded neutral (City Standard) ☐ Wye, floating neutral

Tertiary Delta Winding? ☐ Yes ☐ No

Transformer fuse data (*if applicable*)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

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IX. Additional Information

One-Line Diagram

Enclose site electrical one-line diagram showing the configuration of all DER Facility equipment, current and potential circuits, and protection and control schemes.

- Include the project owner's name, project name, project address, model numbers and nameplate sizes of equipment, including number and nameplate electrical size information for solar panels, inverters, wind turbines, disconnect switches, latitude and longitude of the project location, and tilt angle and orientation of the photovoltaic array for solar projects.
- Depict the metering arrangement required whether installed on the customer side of an existing meter or directly connected to the grid through a new or separate delivery point requiring a separate meter.
- List of adjustable set points for the protective equipment or software should be included on the electrical one-line diagram.
- Signed and sealed by a licensed Professional Engineer if the DER Facility is greater than 150 kW.

Is one-line diagram enclosed? ☐ Yes ☐ No

Site Plan

Enclose site plan showing the physical location of the proposed DER and point of interconnection with the utility.

- Indicate the latitude and longitude coordinates.
- Overlay on an aerial map.
- Included the proposed location of protective interface equipment on property.

Is a site plan enclosed? ☐ Yes ☐ No

Equipment Specifications

Include equipment specification information (product literature) for the solar panels and inverter(s) that provides technical information and certification information for the equipment to be installed with the application.

Are equipment specifications enclosed? ☐ Yes ☐ No

Protection and Control Schemes

- Enclose copy of any site documentation that describes and details the operation of the protection and control scheme.
- Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (*if applicable*)

Are protection and control documents and schematics enclosed? ☐ Yes ☐ No

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X. Applicants Signature

All DER Interconnections must comply with the City's DER Interconnection Technical Standards.

I hereby certify that, to the best of my knowledge, all the information provided in this DER Interconnection Application Form is true and correct. I also certify that I have received a copy of the City's DER Interconnection Technical Standards.

Interconnection Customer

Signature: _____ Date: _____
(Authorized Agent of the Legal Entity)

Printed Name: _____

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DRAFT

Distributed Energy Resource Technical Specifications Manual

PSE Power System Engineering

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Review and Approval				
REV	**Prepared By**	**Date**	**Approved By**	**Date**
A	DFJ	4/20/2020		
B	DFJ & ESS	6/30/2020	ESS	6/30/2020
C	DFJ & KBF	8/24/2020	DFJ	8/27/2020

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1. Introduction

The purpose of this Technical Specifications Manual (TSM) is to outline the technical requirements for safe and effective interconnection of Distributed Energy Resources (DERs) either interconnected to the City of Sturgis, MI (Utility) electric distribution system or connected to the electric facilities of the Utility's electric customer. The Utility's electric distribution system is referred to as the Area Electric Power System (Area EPS) and the electric customer system is referred to as the Local Electric Power System (Local EPS).

DER facilities includes electric generators, battery energy storage systems, and other devices that can be a source of electric power and is ultimately connected in parallel for more than 100 milliseconds, or more than six cycles, to the Area EPS. The Area EPS owned by the Utility is a multi-grounded neutral system energized at a nominal voltage of 7.2/12.47 kV. The way a DER is connected to, and disconnected, from the Area EPS can vary.

1.1. System Impact to Area EPS

Parallel DER facilities connected to the Area EPS can cause a variety of system impacts. Those located individually on higher capacity feeders or circuits may not cause very serious impacts whereas those located on weaker circuits, in aggregation or in special cases (such has lightly loaded conditions) can significantly impact the Area EPS. The interconnection of all parallel DER facilities requires safeguards for synchronization and integration. Further, from the Area EPS perspective, the challenges posed by any given parallel DER facility's interconnection do not diminish significantly with reduction in the facility size. For this reason, each specific interconnection must be studied with respect to its size, its type, and the nature of the Area and Local EPS at the interconnection point. Typically, some level of an interconnection or system impact study will be performed by the Utility of the proposed DER to identify any potential complications. The intent of this study is to avoid adverse impacts to the Area and Local EPS by identifying the impact(s) that will occur under normal and N-1 conditions. Where adverse system impacts are identified, the Utility will determine the required system modifications that can be implemented to mitigate the issue(s).

1.2. Potential Issues

The TSM, in combination with the Utility's interconnection or system impact study, is intended to prevent potential issues. There are a wide range of potential issues associated with the interconnection of DER facilities to the Area EPS including, but not limited to:

- Thermal overloads
- Impact on step voltage regulation equipment
- Increased fault duty on the Area EPS equipment
- Interference with the operation of protection systems
- Harmonic distortion contributions
- Steady state voltage outside of ANSI standards

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- Voltage flicker
- Ground fault overvoltage
- Risk of unintentional islanding
- System restoration
- Power system stability
- System reinforcement
- Metering
- Arc flash

1.3. General Requirements

All parallel DER systems shall be designed to ensure:

- Capability to synchronize with the Area EPS.
- Capability to separate from the Area EPS upon loss of the Utility source.
- No degradation of the Area EPS safety and reliability.
- All energy supplied to the Area EPS will meet the Utility's power quality and transmission system operator requirements.

1.4. On-going Responsibility

The Interconnection Customer (IC) shall be responsible for on-going compliance with regulatory, code, and system design and operating changes pertaining to their installation. This work will be performed at the cost of the IC. The Utility requires all electrical and physical design documents and submittals for DER interconnections with the Area EPS at 600 volts or above to be prepared and sealed by a State-Licensed Professional Engineer in the state where the installation is made, and who is retained by the IC for that purpose.

2. Interconnection Policy

The Utility's interconnection policy permits an IC to operate DER in parallel with the Utility's Area EPS, providing it can be done safely. The Utility strives to provide a safe and reliable interconnection and to carry out the interconnection process in a timely manner.

- All services must meet all applicable requirements of the Utility.
- All DER facilities will require an application and an interconnection agreement.
- All DER facilities sized to sell energy back to the Utility will be required to sign a Power Purchase Agreement (PPA).
- Single-phase and three-phase customer-owned DER may be connected in parallel with the Utility's Area EPS providing these facilities meet the requirements outline in this manual.
- The Utility will reserve the right to open the inter-tie to and DER facility who violates the requirements outline in this manual.

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- The Utility shall not assume any responsibility for the protection of the DER facility, or any other customer's equipment within the Local EPS. The IC shall be completely responsible for protecting their system from any abnormalities.

3. Applicable Codes, Standards, and Guidelines

The DER system shall confirm to the latest revision of all local, state, and federal codes and national standards that apply; including issued amendments unless the Utility has taken exception to such standard. Specific codes and standards applicable to this manual include, but are not limited to:

- Institute of Electrical and Electronics Engineers (IEEE) Std. 1547 "Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power System Interfaces"
- Underwriters Laboratories (UL) Std. 1741 "Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources"
- ANSI/IEEE C2 "National Electrical Safety Code®" (NESC)
- NFPA 70 "National Electrical Code®" (NEC)
- NFPA 70B "Recommended Practice for Electrical Equipment Maintenance"
- NFPA 70E "Standard for Electrical Safety in the Workplace"
- NETA-MTS "Maintenance Testing Specifications for Electric Power Distribution Equipment and Systems"

4. Performance Categories Assignment

Performance categories describe minimum equipment capability and the required ranges of allowable settings.

IEEE-1547-2018 standard provides a technology-neutral approach in which performance categories are assigned to specify required capability for reactive power performance, voltage regulation performance, and response to abnormal conditions.

There are several available performance categories defined in IEEE 1547 standard which contemplates current and future system needs at varying levels of DER penetration. Performance requirements associated with performance categories are driven by Area EPS or Regional Transmission Operator (RTO) needs. The subsections below contain the specific requirements that have been determined to be appropriate for application in the Utility's service territory.

4.1. Normal Condition – Category A and B

Category A and B specify reactive power capability and voltage regulation performance requirements. Category B is intended for use where DER penetration has the potential to be higher and where the DER power output is subject to frequent large variations. Category B encompasses all of Category A capabilities. Category A and B assignment is specified below.

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DER Type	IEEE 1547-2018 Category
Synchronous Machine	Category A
Inverter-Based	Category B

4.2. Abnormal Condition – Categories I, II or III

Abnormal condition category assignments will not be enforced until mandated by the Regional Transmission Operator (RTO) and Bulk Power System (BPS).

DER capable of meeting abnormal performance categories outlined in IEEE 1547-2018 are encouraged to use Category I for synchronous machines and Category II for inverter-based generation.

Categories I, II, and III differentiate performance requirements for DER response to abnormal conditions. These requirements are specified below. Category III is the highest capability and can inherently meet the ride-through requirements of the lower categories. In contrast, the voltage and frequency trip requirements of higher categories may not be met by lower categories as the range of allowable settings may be mutually exclusive.

- Category I encompasses minimum BPS essential needs.
- Category II coordinates with North American Electrical Reliability Corporation (NERC) PRC-024-2 with a modification to the voltage ride-through in order to account for characteristics of distribution load devices.
- Category III covers all BPS reliability needs and also introduces ride-through requirements aimed at addressing high DER penetration integration issues such as power quality events and other abnormal system conditions which may arise from DER tripping in the Local EPS.

4.3. Default Parameters

The DER shall use the IEEE 1547 default parameter settings for all capabilities and performance requirements of the applicable performance category. In order to protect the Area EPS and BPS reliability and to produce a response from DER that can be modeled, deviating from the IEEE 1547 default parameters for abnormal performance category settings should be a rare occurrence.

4.4. Alternative Abnormal Operating Performance Category

Desired performance outside of what is defined in this document will require study and agreement between the Utility and the IC. Mitigation of abnormal operating conditions may be required at the expense of the IC.

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5. Power Factor Capability and Voltage/Power Control Performance

5.1. Constant Power Factor

All new DER interconnections shall be capable of providing a constant fixed power factor from 90% leading (absorbing) to 90% lagging (injecting). The required constant fixed power factor will depend on the size, type, location, and studied impact. Typically, for larger DER installations, the fixed power factor value will be identified in the interconnection study process and may additionally be specified in the interconnection and operation agreement.

The default power factor setting for synchronous and inverter-based generation shall be set to 98% absorbing reactive power unless specified differently by the Utility.

Induction generators less than or equal to 250 kW may be allowed to operate with minimal power factor correction at 0.95 leading (absorbing vars). Induction generators greater than 250 kW must have the capability to expand power factor capabilities with external devices such as a Static VAR compensator (SVC).

5.2. Voltage and Power Control Performance

In addition to constant power factor functionality, the DER shall be capable of adjusting active and reactive power output to maintain the Area EPS voltage within thresholds designated by the Utility and IEEE 1547-2018. The DER shall not actively regulate the Area EPS voltage without the approval of the Utility. Voltage and power control functions shall be available by DER category as indicated in the following table.

Control Function	IEEE 1547-2018 Category
Constant Reactive Power Mode	Category A & B
Voltage-Reactive Power Mode	Category A & B
Voltage-Active Power Mode	Category B
Active Power-Reactive Power Mode	Category B

6. Response to Abnormal Conditions

Abnormal conditions can occur on the Area EPS or BPS. Under these abnormal conditions the DER shall respond appropriately. Currently IEEE 1547-2018 certified inverters are not readily available, therefore inverters certified to the requirements of, IEEE 1547a-2014 should be used under abnormal conditions. The settings in this Section are based on IEEE 1547-2003 and should be used.

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6.1. Voltage Disturbance Delay & Trip Times

The IC shall operate their DER to maintain the same voltage level as the Area EPS at the PCC/POI and voltage regulation is required to be in service whenever the DER is synchronized to the system. Undervoltage and overvoltage functions are applied to prevent unintentional islanding operation during an islanding event. The IC must provide an automatic method of disconnecting their DER(s) from the Area EPS if the voltage cannot be maintained within the Utility's limits as stated in the following table.

Voltage Disturbance Delay and Trip Time				
Trip Function	**Range**		**Clearing Time**	
	Percentage	**Voltage (@ 120 V Base)**	**Seconds**	**Cycles**
OV2	> 120%	> 144	0.16	9.6
OV1	110% - 120%	132 - 144	1.0	60
No Action	88% - 110%	105.6 - 132	No Operation	
UV1	50% - 88%	60 – 105.6	2.0	120
UV2	< 50%	< 60	0.16	9.6

6.2. Frequency Disturbance Delay & Trip Times

The nominal frequency of the Area EPS is 60 Hz and is maintained within the limits of 59.3 - 60.5 Hz under normal steady-state operation. Under frequency and over frequency functions are applied to prevent unintended islanding operation. The IC shall provide an automatic disconnecting means from the Area EPS when DER falls outside the limits stated in the following table.

Frequency Disturbance Delay and Trip Time				
Trip Function	**Range**		**Clearing Time**	
	Percentage	**Frequency (Hz)**	**Seconds**	**Cycles**
OF2	> 103.3%	> 62.0	0.16	9.6
OF1	102.0% - 103.3%	61.2.0 – 62.0	300.0	18000
No Action	97.5% - 102.0%	58.5 – 61.2	No Operation	
UF1	94.2% - 97.5%	56.5 - 58.5	300.0	18000
UF2	< 94.2%	< 56.5	0.16	9.6

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Larger DER units, including units above 10 MVA, may be required to have over/under frequency protective (device 81 O/U) relaying set points that coordinate with the BPS automatic underfrequency load shedding program (UFLS). The RTO UFLS program and the North American Reliability Corporation (NERC) reliability standard PRC 006 govern the requirements. These requirements are dynamic and adjust overtime to meet changing system needs. Therefore, DER units that currently do not have ULFS requirements today may have to comply with future requirements, including smaller installations. DER facilities must not separate from the system until all underfrequency load shedding steps have operated.

6.3. Dynamic Voltage Support

Dynamic voltage support is currently not allowed and shall be disabled.

6.4. Governor Droop

All DER units greater than 250 kW with active governors should be operated in automatic mode unless directed otherwise by the Utility. To provide equitable and coordinated system response to load and generation imbalances, governor droop should be employed, and governors should not be blocked or operated with excessive dead-bands. Cogeneration units associated with an industrial process may not be able to provide a large signal response but are encouraged to have a small signal response active. The default droop setting is 5%.

7. Protection Requirements

7.1. Manual Disconnect Switch

A manual disconnecting device, capable of interrupting the rated DER and/or load current, accessible to the Utility's personnel, and which can be locked open with a visible open for line clearances, must be provided. The visible open shall be viewable without unbolting covers or assistance from site personnel. The switch must be accessible to the Utility's personnel without assistance from site personnel. The form of this device will vary with the service voltage and generator capacity.

The manual disconnect switch must be clearly marked with a permanent, weather-proof label. For DER facilities where the switch and/or production meter are not located in close proximity to the Utility's revenue meter, the IC must post at the revenue meter a permanent, weather-proof, clearly labeled map or diagram showing the location of the revenue meter, the switch, production meter, and DER facility.

DER facilities that do not operate continuously in parallel with the Area EPS may omit the disconnect switch. To qualify, the IC system must be a separate system never in parallel, a high-speed transfer, or closed transition limited to a maximum of 2 minutes in parallel.

7.2. Protective Devices

Protective devices (relays, circuit breakers, etc.) for the protection of the Area EPS, metering equipment, and synchronizing equipment must be installed as required by the Utility and IEEE 1547-2018. The

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complexity of the protective devices differs with the size, complexity, and location of the generation installation.

7.3. Protective Relay Default Settings

For the protective functions required under IEEE 1547-2018, the default settings provided in IEEE 1547-2018 shall be used unless the interconnection review indicates some other setting is to be used. The exception is the underfrequency relay setting as previously discussed.

7.4. Protection Requirements by DER Size Classification

The Utility has established seven different classes of protective relaying for distribution interconnected generation. These are provided as guidance and are meant to be consistent with IEEE 1547-2018. IEEE 1547.2 provides additional discussion, design considerations, and approaches to address specific applications. The following table provides a summary of protection requirements.

Summary of Relaying Requirements								
Type of Interconnection	**Over-current (50/51)**	**Voltage (27/59)**	**Frequency (81 O/U)**	**Reverse Power (32)**	**Lockout (86)**	**Parallel Limit Timer (62)**	**Sync-Check (25)**	**Transfer Trip**
20 kW and Under (Section 16 Figs. 1 & 2)	-	YES(1)	YES(1)	-	-	-	YES(1)	-
20 kW to 250 kW (Section 16 Figs. 3 & 4)	YES(1)	YES(1)	YES(1)	YES(1)(3)	-	-	YES(1)	-
250 kW to 1 MW (Section 16 Fig. 5)	YES(1)	YES(1)	YES(1)	YES(1)	YES	-	YES	YES(2)
1 MW to 10 MW (Section 16 Fig. 6)	YES(1)	YES(1)	YES(1)	YES(1)	YES	-	YES	YES(2)
>10 MW (Section 16 Fig. 7)	YES	YES	YES	YES	YES	-	YES	YES(2)
Hot Transfer Standby Generation	YES	YES	YES	YES	YES	YES	YES	YES(2)
Soft Loading Transfer System	YES(3)	YES(3)	YES(3)	YES(3)	YES(3)	YES	YES	YES(2)

(1) For systems with certified inverters, these functions may be built into the inverter.
(2) The need for transfer trip will be determined by the Utility when studied.
(3) The need for these protective elements will be reviewed by the Utility.

Where multiple DERs are connected to the Area EPS through a single service point, the class will be determined by the sum of the DER ratings. The classes are based upon generator or inverter nameplate ratings.

These classes have been established for convenience and are based on circuits with normal load density. The final decision as to the requirements for each installation will be made depending on IC load magnitude, the magnitude of other loads connected to that circuit or Area EPS, available short circuit

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contribution, source substation size, line conductor size, etc.

The noted protection is for the protection of the Area EPS and other customers connected to the Area EPS. In each application, protective relaying associated with the interface requirements will be reviewed by the Utility. The IC shall be responsible for determining their own relay settings. The IC should provide documentation that their interconnection relaying and settings are in accordance with these documents before the start of relay trip checks. Small certified interconnection packages up to 20 kW normally do not require relay setting determination.

Non-certified installations and DER facilities greater than 250 kW require utility grade relays. The following specifies what a utility grade relay should include:

- Meets or exceeds ANSI/IEEE Standards for protective relays (i.e., C37.90, C37.90.1, and C37.90.2).
- Extensive documentation covering application, testing, maintenance, and service.
- Positive indication of what caused a trip (Targets).
- A means of testing that does not require extensive unwiring (e.g. a draw out case, test blocks, FT- 1 switches, etc.)

7.4.1. Installations of 20 kW and Under

Most installations in this class feature a certified interconnection package. Each package will be reviewed by the Utility to verify that it is certified and applied in a manner consistent with its certification. Relay settings will be reviewed for inverters certified under IEEE 1547-2018.

Except for certified interconnection packages, all installations in this class will require a design and relay review by the Utility (i.e., metering and relaying one-lines, protection, and control schematics, relay setting sheets, and nameplate data of the generator(s), breaker(s), and disconnect switch(es)). The Utility will determine if a relay and site inspection (i.e., witnessing the calibration and testing of the relays and operation of the generator and breakers) is also required.

Stand-alone energy storage (battery) installations must be permanently wired into a suitable load center in accordance with the NEC (see Article 690 for PV and 702 for Standby). A lockable disconnect switch must be provided that is readily accessible to the Utility's personnel. This switch is to be at the metering point unless an alternate location is readily accessible and easily identifiable. The Utility must approve the alternate location and a durable map or written sign should be provided at the metering or PCC location indicating the location of the switch.

7.4.2. Installations of 20 kW to 250 kW

Except for certified interconnection packages, all installations in this class will require a design and relay review by the Utility (i.e., metering and relaying one-lines, protection, and control schematics, relay setting sheets, nameplate data of the generator(s), breaker(s), disconnect switch(es), and certified test reports). The Utility will determine if a relay and site inspection (i.e., witnessing the calibration and

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testing of the relays and operation of the generator and breakers) is required. Installations using certified interconnection packages do not require the full documentation; however, review of relay settings is required.

Installations that use a certified package will be given a quick review. All installations that are not a standard package must be reviewed individually. Some variation in the specifics of the requirements, but not the intent, will be allowed. The intent is to be consistent with IEEE 1547-2018 requirements. The Utility must approve all variations. Non-certified installations in this class may use either industrial grade or utility grade relays.

7.4.3. Installations from 250 KW to 1 MW

All non-certified installations in this class will require a design and relay review by the Utility (i.e., metering and relaying one-lines, three-lines, protection and control schematics, relay setting sheets, nameplate data of the generator(s) and breaker(s)/disconnect switch(es) and certified test reports will be provided to the Utility by the Customer. A site inspection (i.e., witnessing the calibration and testing of the relays and operation of the generator and breakers) is also required. The documentation and review can be reduced if certified interconnection packages are used. For this size range, the proposed relay settings must be provided for certified packages.

Installations in this size range may be an assembly of two or more certified interconnection packages. This is a common practice with photovoltaic sites. The certification process certifies the design and functionality for only one inverter package with its associated energy source. It does not address the increased system and protection impacts that multiple certified units will have. Because of this, a site with multiple packages must be reviewed and additional protective equipment and field-testing may likely be required for the larger composite installations. The use of certified inverters will reduce the time and cost of reviews and later commissioning.

With some of the larger installations, the IC instead of the Utility may own the transformer and associated equipment. Utility grade protective relays and utility grade equipment are required. The protective relaying aspects of certified interconnection packages are accepted as meeting the Utility grade requirement for that portion of the facility.

7.4.4. Installations from 1 MW to 10 MW

All installations in this class will require a design and relay review by the Utility (i.e., metering and relaying one-lines, three-lines, protection and control schematics, relay setting sheets, nameplate data of the generator(s) and breaker(s)/disconnect switch(es) and certified test reports will be provided to the Utility by the IC). A site inspection (i.e., witnessing the calibration and testing of the relays and operation of the generator and breakers) is also required.

Installations in this size range may be an assembly of multiple certified interconnection packages. This is a common practice with photovoltaic sites. The certification process certifies the design and

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functionality for only one inverter package with its associated energy source. It does not address the increased system and protection impacts that multiple certified packages will have. Because of this, a site with multiple packages must be reviewed and additional protective equipment and field-testing will likely be required. The use of certified inverters will reduce the time and cost of reviews and later commissioning.

Facilities in this size range are strongly encouraged to be located within two-line miles of the substation. Expensive system modifications and restrictive operating requirements become increasingly likely as the distance from the sub increases. Many rural systems will not accept this class of generation or may require extensive rebuilding and reinforcement. The IC may be required to interconnect with the transmission system.

With some installations, the transformer and associated equipment are owned by the IC instead of the Utility. Utility grade protective relays and utility grade equipment are required.

7.4.5. Installations 10 MW and Above

In general, the Area EPS is designed to handle loads and DER up to 10 MW for urban/suburban circuits. Rural circuits are typically less than 10 MW. Installations greater than 10 MW are usually served from the sub-transmission (46 or 69 kV) or transmission (115 or 230 kV) system. DER facilities in excess of 10 MW are more likely to impact the Bulk Power System (BPS) and may be required to go through the FERC Small Generation Interconnection Process (SGIP).

7.4.6. Hot Transfer Standby Generation

A hot transfer standby DER system is defined as one in which an IC's generation can be connected to the Area EPS for more than 2 minutes but not on a continuous basis. These DERs fall under the same requirements as a DER that is continuously connected to the Area EPS. Since this type of installation often employs a sensitive direction power relay to aid in separation, some of the interconnection requirements may be relaxed, at the sole discretion of the Utility.

7.4.7. Soft Loading Transfer System

A soft transfer system is defined as one in which the paralleling of the Area EPS and the IC's DER equipment is less than 2 minutes. A soft or closed transfer is permitted for the purpose of avoiding excessive voltage and frequency deviations to the IC's load. Where the load is large, the transfers are to have a controlled ramp rate to avoid undue voltage disturbances to other customers. If the paralleling time has been exceeded, a breaker or switch must be automatically tripped to isolate the Area EPS from the IC's generators.

Because of the complexities in the closed transfer system(s), each installation will need to be reviewed on a case-by-case basis. Due to the brief nature of the paralleling exposure, reduced interconnection requirements may apply, such as waiving the effective grounding requirements in some cases. Machine

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based DER that will parallel for less than two-minutes and that will equal or exceed 1 MW of aggregated DER requires review and a signed interconnection agreement. This size and type are likely to require voltage supervision of reclosing.

7.5. Additional Protection Requirements by Generation Type

7.5.1. Synchronous Generators

The Utility will review the settings of the IC's synchronizing relaying to verify the settings are within the guidelines of IEEE 1547-2018. This is to ensure settings suitable to prevent excessive voltage transients on the Area EPS are used. The Utility shall not take responsibility for the appropriateness of any given setting for protecting the IC's equipment. It is highly recommended that the IC consult with the manufacturer of their equipment for settings that are appropriate for the protection of the IC's equipment. Small interconnection facility packages that are certified for use with synchronous generators will include this functionality.

Sync-check relays (Device 25 or 25X) should be included in addition to the synchronizing relays on large synchronous generators. The 25X function should be a separate device (i.e., not included in the synchronizer) for all units 1 MW and above. The 25X, 25 relay, and any other sync relaying, must not allow the IC's facility to energize a de-energized utilities line. This is for the safety of the Utility personnel and the public. The maximum phase angle error and voltage difference allowed by the 25X relay, and other sync relaying as well, should be consistent with the guidelines in IEEE 1547-2018.

7.5.2. Induction Generators

Speed matching may be by any means such that voltage regulation and voltage flicker are held within the tolerances earlier described. Double-fed induction generators may behave similar to synchronous generators and need synchronizing relays similar to those required for synchronous generators.

For medium size induction generators (typically above 250 kW), a mechanical speed matching relay (device 15) set to accept mechanical speed within +3% of 60 Hz must be used. A +1% speed match band will be required for large induction generators. The largest effect on the system of bringing an induction generator to synchronous speed is the voltage drop associated with the magnetizing inrush current upon connection to the Area EPS.

7.6. Transfer Trip Considerations

Transfer trip (TT) is a protection method whereby the conditions at one location causes a signal to be sent via a high speed communication channel to another location resulting in a breaker trip or some other form of separation from the Area EPS to occur. For DER installations, the originating event is usually the feeder breaker at the substation tripping with the high speed signal being sent to the DER to cause separation from the distribution feeder. The TT may originate on the transmission system for high penetration situations, especially if the substation is supplied where no transmission voltage circuit

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breakers are present. TT is mainly used when studies indicate local anti-islanding protection is marginal or inadequate to ensure a timely disconnection to adequately protect the other customers on the feeder. The DER may desire this protection to protect a large rotating generator from damage.

For smaller DER and lower penetrations, TT is rarely needed since large rotating generators are typically not included. Since the DER's receiver must be connected to the feeder breaker and since feeders are field switched, especially during contingencies, TT requires that the communications path to the new source is established using pre-installed transmitters, adding cost and complexity to the installation. When large rotating generators are included, TT will be necessary for many of the situations. While uncommon, TT may be needed for large inverter-based facilities even without any rotating machines present.

7.7. Open Phase Protection

The DER shall detect and cease to energize all phases to which the DER is connected for an open phase condition on the Area EPS occurring directly at the reference point of applicability. The requirement to cease to energize for a single-phase condition shall apply to both three-phase inverters and three-phase installations made up of single-phase inverters. As required by IEEE 1547-2018, the DER shall detect and cease to energize for unintentional islands. When restoring output after momentary cessation, the restore output settings of the DER shall be coordinated with the Area EPS reclosing timing.

7.8. DC Fusing

Larger DER installations must have some form of interconnection facility protection redundancy to ensure that a single failure does not disable all interconnection protective relaying and separation functions. For larger facilities, the use of a single, fused DC relaying string is not allowed. Adequate protection for the loss of a DC fuse must be provided. A loss of potential scheme shall be used when a duplicate relay scheme or package is not used. Due to the severe consequences that may occur for a large DER unit if all protective relaying is lost due to a blown fuse, some form of redundancy is required.

7.9. Grounding

The Area EPS is an effectively grounded system and requires that the DER connected to the Area EPS be designed (through the selection of transformers, generator grounding, etc.) so that they contribute to maintaining an effectively grounded system in conformance with IEEE 1547-2018. A DER facility that does not participate in maintaining effective grounding, upon islanding, can cause severe over-voltages to single-phase loads, resulting in equipment damage. IEEE 1547.2 provides additional discussion on the importance of and methods to address effective grounding. Inverter-based DER facilities under 250 kW, hot transfer standby generation, and soft loading transfer systems are typically excluded from this requirement.

Neutral reactors are required in several configurations for both rotating machines and inverters. A reactor has four ratings; reactance, continuous current rating, maximum current withstand for a

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maximum duration, and a voltage rating. The voltage rating for an air core reactor should exceed the withstand current times the reactance. If the voltage rating is for an iron core reactor, it must exceed the current times reactance plus a margin to ensure the reactor does not saturate under fault conditions. The lesser of 125% of current times reactance or full line-neutral voltage is suggested.

Direct connected rotating machines must comply with the traditional IEEE grounding standards. To achieve effective grounding, the IC's system Thevenin equivalent impedance must meet the two criteria given below or otherwise meet a coefficient of grounding of 80%, (see IEEE 32 and IEEE C62.92.2). Note – the effective grounding impedance is always determined with the DER separated from the Area EPS. Momentary fault withstand and continuous current ratings are always determined with the Utility and DER connected.

- The positive sequence reactance is greater than the zero-sequence resistance (X1 > R0).
- The zero-sequence reactance is less than or equal to three times the positive sequence reactance. The Utility requires the ratio to be between 2.0 and 2.5 (2.0*X1 < Xo < 2.5*X1) to limit the adverse impacts on feeder ground relay coordination.

7.9.1. Synchronous and Induction Generators

When calculating faults and effective grounding using the positive, negative, and zero sequence impedance networks, the networks should include impedances for the following: the step-up transformer, generator sub-transient reactance (Xd"), neutral grounding reactance on the step-up transformer and/or generator, secondary cable runs greater than 50 feet in length, and the grounding bank. For induction generators, the equivalent of the sub-transient reactance should be used. If the Xd" equivalent is not available, the following approximation is usually adequate:

$$XX = \frac{RRRRRRRRRR\ VVVVVVRRRRVVRR}{LLVVLLLLRRRR\ \ RRVVRRVVRR\ \ CCCCRRRRRRCCRR}\ \Omega$$

The IC should submit the grounding device information for approval before it is purchased.

Many different system configurations will meet the effective grounding requirements. Transformer winding configurations are provided later in this manual and their ability to pass ground referencing through or to act as a ground source. Listed below are some guidelines and restrictions.

- A grounded-wye/grounded-wye step-up transformer is common and aligns with the Utility's transformer standards. When this transformer arrangement is used, the DER must have an appropriately sized grounding bank, or the DER's neutral must be adequately grounded (typically through a grounding reactor) to meet the utilities requirements for effective grounding. Utility supplied three-phase service transformers are grounded-wye/grounded-wye for four-wire systems.
- A delta (DER)/grd-wye (Utility) step-up transformer must have a reactor in its grounded-wye neutral ground bank, (2.0*X1 < Xo < 2.5*X1). A neutral resistor will cause high power losses and is not recommended. The Utility does not supply this configuration.

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- A delta step-up transformer, with delta on the Utility's Area EPS side, may be used. When this configuration is used, a grounding bank must be installed on the primary side of the generator step-up transformer. The grounding bank's impedance must be selected so that it meets the Utility's effective grounding requirements above, and it must be rated to withstand the system fault current and voltage imbalance. This configuration requires a switching device to separate both the DER and ground source during system separation. Utility supplied three-phase service transformers are generally delta on the Utility side for three-wire systems.

DERs that produce power at line voltage (i.e., a step-up transformer is not needed) either must be adequately grounded (typically through a grounding reactor in the generator neutral) or have a grounding bank to meet the Utility's effective grounding requirements. Grounding the DER is not recommended since significant DER derating due to unbalanced currents may result.

Voltage imbalance on the Area EPS may result in substantial current flowing into an IC's DER or grounding equipment. The Utility's operating objective is to keep phase-to-phase voltage imbalance under 1% and phase-to-ground voltage imbalance under 3%. Imbalance may be higher, especially during contingency conditions. The IC's equipment must be able to withstand allowable voltage imbalances and be able to operate during an imbalance condition. A zero sequence voltage of 4% is recommended for determining the continuous imbalance rating. This rating should be adequate for contingency system configurations.

Normal system source impedance data for a given location can be obtained from the Utility. For contingencies and maintenance, field ties are temporarily used, and this can change the source impedance and fault duties as seen by IC. Normal system source impedance should be obtained before an IC purchases grounding equipment so that the equipment purchased will be appropriately rated (both for steady state and short time duty) for the given location.

7.9.2. Inverters, Double-fed Induction Generators, and Others

Inverter installations that are large, single-unit, or composite facilities should be checked for effective grounding equivalency. IEEE C62.92.2 directly applies to rotating generation and cannot be directly applied to inverters to determine ground referencing equivalency since grid connected inverters operate as a current source, not as a voltage source. Small, single-phase inverter installations are usually exempt from this requirement.

Double-fed induction generators have an equivalent short-circuit impedance that is available from the manufacturer. The equivalent combines the fault output of the stator windings and the inverter output from the rotor windings. Some double-fed generators employ a crowbar circuit on the rotor that is activated during upsets. Once the rotor is shorted, the generator acts like a standard induction generator.

The grounding requirement applies regardless of the energy source providing power to the inverter. The grounding method used needs to be compatible with the step-up transformer configuration. For three-

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phase installations, the phase-to-neutral over-voltages during a single line-to-ground fault must be constrained to avoid exposing the single-phase loads connected on the un-faulted phases to excessive voltage (<130% Ph-N rated voltage). The equivalent of a coefficient of grounding of 80% must be achieved, also see C62.92.4.

The following sizing method meets the grounding requirement. Transformer winding configurations and their ability to pass ground referencing through or to act as ground source is defined later in this Standard.

The grounding device or neutral reactor may be estimated according to the following criteria:

$$XX_{0|DDDDDD} = 0.6 \pm 10\%\ pp.CC. \text{ and } \frac{XX_{0|DDDDDD}}{DD_{0|DDDDDD}} \geq 4 \text{ where } 1\ pp.CC.iiii\ bbRRiiiiRRRR\ VVCC\ ZZ \frac{kkVV^2}{bbbbbbbb\ MMVVMM_{DDDDDD}}$$

DER Interface Transformer (DERIT) and Neutral Grounding Reactor (NGR)

a. the total kVA rating of the DER Facility (sum of DERITs' kVA ratings) and high side kV rating of the DERIT(s) for Grounding Transformer sizing; or
b. the kVA and high side kV rating of the DERIT for NGR sizing.

General notes include:

- DERIT kVA rating is assumed to be approximately equal to the DER capacity.
- For inverter-based interface, the "0.6" factor is a conservative approximation.
- Assume W_0=4% NGR or transformer should have a continuous current rating based on $II_{0|GGGG} = \frac{(4\%\ W_0)}{XX_{0|DDDDDD}}$
- Momentary fault withstand must have a time rating of 5 seconds or more with 10 seconds recommended.

Many three-phase inverters will not meet the grounding requirement. Some manufacturers employ an internal high resistance between the transformer's internal wye and the neutral or ground connection, which does not qualify as ground referencing. Some manufacturers connect the inverter transformers in a delta configuration. The presence of a neutral connection on the inverter does not ensure a grounded- wye configuration. If the inverter does not provide adequate ground referencing, either a small grounding bank will be needed or grounding with a separate wye-grounded/delta transformer with neutral reactor will be needed. See later discussion of three-phase installations using single-phase inverters.

An inverter with a delta/grounded-wye matching transformer will experience imbalanced current due to distribution system voltage imbalance. This may limit the inverter output capacity or result in overcurrent shut-downs during distribution system ground faults. A solid ground connection without a suitable neutral reactor is not recommended. Use of a neutral resistor is not recommended due to the

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ongoing elevated losses. A neutral reactor will reduce the imbalance current, operation issues, and losses. A grounding transformer avoids these issues and is the recommended approach.

"Transformerless" inverters rated 250 kW or less may be exempted by the Utility at their sole discretion. Above 250 kW, a separate ground referencing source must be provided.

DER technologies other than those discussed above may come into use. The same principles will apply to them. The DER interconnected to the Utility's effectively grounded Area EPS must provide effective ground referencing.

7.9.3. Multi-Inverter Installations

Larger facilities are often comprised of multiple inverters, each with its own string of PV panels. For medium size installations with a secondary voltage Point of Coupling (PCC), a single ground referencing device may be installed to handle the entire facility. It can be sized in the same manner as described above. The sum of all of the included inverter AC nameplate ratings is used in the formula along with voltage at the location where the ground reference will be attached.

This same approach is used for large PV installations. The ground reference is often located at the medium voltage DER bus that connects to the PCC. The voltage to use in the formula is the medium voltage location rated voltage. The grounding method used needs to be compatible with the step-up transformer configuration.

7.9.4. Single-Phase Inverters

Three-phase DER facilities comprised of single-phase inverters must comply with NEC 705.40, 42, and 100. This applies whether there is one single-phase inverter per phase or multiple micro-inverters. Upon loss of one phase or one phase of the facility trips, the facility must cease exporting power or sense and separate the generation on all three phases. Any three-phase facility that is large enough to require the use of a grounding bank must sense and totally separate for loss of one or more phases or tripping of one or more DER phases.

Three-phase DER facilities comprised of single-phase inverters shall be designed to produce power that is closely balanced per phase. The same considerations apply to single phase secondary service if inverters are applied hot leg to neutral. Operation that results in unbalanced power production or resulting voltage unbalance in excess of the Utility's requirements shall cease operation until a balance better than the Standard's minimum requirements can be met.

7.9.5. Ground Referencing Transformer Configurations

Three-phase DER Facilities must be ground referenced when interconnected to the four wire Area EPS. The only two types of sources that provide a ground reference includes a) a transformer with the suitable winding configuration or b) a grounded wye rotating machine. Inverters do not provide a ground source, but they may have interface transformers that can.

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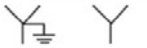
Transformer winding configurations that can provide a ground source also provides a source for zero sequence current. The below table identifies which transformer winding configuration provides a source for zero sequence current. The Utility's standard distribution transformer is the grounded-wye to grounded-wye. It will pass zero sequence ground reference current through to the opposite side but will not provide a zero sequence source.

If the IC is supplying the step-up transformer, there must be either a secondary ground source with a suitable transformer winding configuration or a primary ground source provided.

Transformation Primary (Pri.) ⟵ Secondary (Sec.) ⟶	Passes Zero Seq. Current?	Provides a Source for Zero Seq. Current?
	No	No
	No	No
	No	No
	Yes	No
	No	No
	No	Yes (to Sec. only)
	No	Yes (to Pri. only)
	No	No
	No	Yes (to Sec. only)
	Yes	Yes (to Pri. and Sec.)
	Yes	No
	Yes	Yes (to Pri. and Sec.)

7.9.6. Ground Relays

When the IC install ground sources as discussed above, the Utility's ground overcurrent relays located at the substation and on distribution feeders will be de-sensitized during a single-line-to-ground fault when an IC's DER is operating in parallel. If the IC contributes more than 10% to a feeder line-to-ground fault, corrective measures become likely. This is rarely an issue when the generation facility uses inverters. When the IC's grounding contribution is relatively large, the Utility may require additional feeder protection equipment, at the IC's expense, to ensure a reliable and secure system configuration is maintained. The same loss of sensitivity for three-phase faults is possible especially with large rotating generation.

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7.9.7. Grounding Bank Protection

When ground referencing transformers are installed to comply with the requirements, the protective relaying design and device ratings will be reviewed. The protection must be compliant with NEC Article 450.3, 450.5(A), or NESC as is applicable. The generation source must be off-line or be tripped off-line if the ground referencing transformer is unavailable or fails. If a protection scheme is AC powered, it shall be designed to minimize accidental disabling. The NEC required grounding transformer overcurrent protection should have enough time delay to coordinate with the Utility protective relaying. Protection with time delay should have a time delay that places the tripping characteristic at the grounding transformer's maximum current and withstand time rating. Protection schemes that remove ground referencing during times that the generator is off-line will be reviewed to ensure ground referencing is in service whenever the generator becomes active.

7.9.8. Non-effectively Grounded DER Connected Producers

At the sole discretion of the Utility, a DER facility under 250 kW may be other than effectively grounded if it can be shown that when the DER is islanded from the Utility and is still generating power, the kW load that will be served from the DER during the islanding condition will at all times be at least three times greater on each phase than the DER's per phase kW rating. In general, a facility under 250 kW that passes the Fast Track Screening will qualify for the ungrounded operation option. All inverters connected to spot or area networks must be effectively grounded on the secondary side.

8. Operations

8.1. Periodical Testing & Record Keeping

All interconnection-related protection and control systems shall be periodically tested and maintained, by the IC, at intervals specified by the manufacturer or system integrator and shall not exceed 10 years. Periodic test reports and a log of inspections shall be maintained by the IC and made available to the Utility upon request. The Utility shall be notified prior to the testing of the protective and control systems to witness the testing if so desired. The testing procedure for re-test shall be a functional test of the protection and control systems.

The IC shall notify the Utility prior to any of the following events occurring:

- Protection functions are being adjusted after the initial commissioning process.
- Functional performance changes of the DER.
- Functional software or firmware changes are being made on the DER.
- Any hardware component of the DER is being modified in the field or is being replaced or repaired with parts that are not substitutive components compliant with this standard.
- Protection settings are being changed after factory testing.

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The Utility recommends any system that depends upon a battery for trip/protection power shall be checked and logged once per month for proper voltage.

8.2. Enter Service and Synchronization

Enter Service refers to DER starting operation following a planned or unplanned outage caused by the Area EPS or IC. Following an outage on the Local EPS, Area EPS, or other loads on the Area EPS will automatically result in the DER placing an increased power flow impact on the system. Energy storage systems should delay their recharging following these events to reduce this increased demand. All DER may also be asked to delay their starting times.

For Non-energy storage systems, the following are examples of possible restart requirements.

- The delay time for restarting of the DER after an outage may be increased.
- The DER shall stagger the restarting of inverters under normal restarting.
- Multiple transfer switches may be required for block loading DER to break up the blocks of the load transferred to the DER.

For energy storage systems, the following are some possible methods which may be required.

- The delay time for restarting of the DER after an outage may be increased.
- The charging of the energy storage system may require a predefined ramp rate.
- The discharging of the energy storage system may require a predefined ramp rate.

Refer to the energy storage systems Section below for the requirements.

When entering service, the DER shall not energize the Area EPS until voltage and system frequency are within the ranges specified below.

Enter Service Criteria		**Default Settings**
Applicable voltage within range	Minimum value	≥ 0.917 p.u.
	Maximum value	≤ 1.05 p.u.
Frequency within range	Minimum value	≥ 59.5 Hz
	Maximum value	≤ 60.1 Hz

The DER shall parallel and synchronize with the Area EPS in accordance to IEE 1547.

8.3. Power Ramp Rates

After meeting the requirements for entering service and synchronization considerations must be made on the appropriate ramp rates of DER to prevent operational problems. As part of a system impact study, step changes in load and generation will be studied to determine the impact to system voltage. A

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maximum of 3% change in voltage is allowed. Should the DER cause step changes beyond this mitigation will be needed.

8.4. Power Quality

The interconnection of the IC's DER equipment with the Utility's system shall not cause any significant reduction in the quality of service being provided to other Utility customers. Certified inverters, unless they are malfunctioning or misapplied, will generally comply these requirements. Abnormal voltages, frequencies, harmonics, or interruptions must be kept within limits specified under IEEE 1547 and IEEE 519. If high or low voltage complaints, voltage flicker, transient voltage complaints, and/or harmonic (voltage distortion) complaints result from operation of an IC's DER, such DER equipment may be disconnected from the Utility's system until the IC resolves the problem. The IC is responsible for the expense of keeping the DER in good working order so that the voltage, Total Harmonic Distortion (THD), Total Demand Distortion (TDD), power factor, and VAR requirements are met. IEEE 1547.2 provides additional discussion and approaches for identifying and addressing these issues.

8.5. Operating and Maintenance Agreements

Operating and maintenance requirements are documented in Interconnection and Operating Agreement. The operating and maintenance requirements are created for the benefit of both the IC and the Area EPS and shall be agreed to between the parties.

Operating and maintenance requirements may be reviewed and updated periodically to allow the operation of the DER to change to meet the needs of the IC and the Area EPS. There may also be changes required by external issues, such as changes in FERC and RTO recommendations or policies, which may require the updates to the operating and maintenance requirements.

The following is a list of typical items that may be included as operating and maintenance requirements.

- Operational requirements, settings, and limits for DER when the Area EPS is in a normal condition
- Operational requirements, settings, and limits when the Area EPS is in an abnormal condition due to maintenance, contingencies, or other system issues
- Permitted and disallowed energy storage system control modes
- BPS or Area EPS limitations and arrangements that could impact DER operation
- DER restoration of output or return to service settings and limitations
- Response to control or communication failures
- Performance category assignments (normal and abnormal)
- Dispatch characteristics of DER
- Notification process between IC and Area EPS

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- Right of Access
- Routine maintenance requirements and definition of responsibilities
- Material modification of the DER that may impact the Area EPS

9. Control Systems

The IC may choose to limit the AC capacity of a DER system using power controls. Power controls may also be used to limit DER system export levels to the Local EPS and/or the Area EPS. There are many possible reasons for implementing power controls, including meeting specific tariff terms or to mitigate the maximum level of power which can flow on the Local EPS and/or Area EPS.

These capabilities are referred to as power control limited capacity, power control limited export, and power control limited import. These terms are discussed in the following sections and may be generally referred to as power control limiting. Power control limiting may be accomplished using a power control limiting system. An alternate option, specifically related to assurance that the DER does not export power (non-export) to the Area EPS, is to implement the limit through relaying or by sizing DER in relationship to the size of the Local EPS load. The use and method for power control limiting shall require approval from the Utility.

9.1. Power Control System Requirements

If a power control system is used, it must meet the following requirements:

- Control system must monitor import and export power at the point of common coupling with the Area EPS.
- Shall control energy production from the DER by tripping or curtailing energy production within 2 seconds of receiving a signal to do so.
- Shall self-monitor the control system, such that failure of the control system to control or monitor will result in the tripping of the DER or separation from the Area EPS. This includes loss of control system power.
- The power to the control system must be battery backed up.
- Access to configuration and settings should be restricted to authorized and qualified personnel by means of password protection.

9.2. Common Control Modes

An operating mode means the mode of DER operational characteristics that determines the performance during normal and abnormal conditions. Several operating modes are most typical with power control systems. Most services provided by a power control system can be categorized into one of three common operating modes, although each service will have unique settings depending on the specific goal of the power control system. In the Interconnection Application and on the one-line diagram, one

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of these three operating modes shall be listed. If none of the below apply, provide a description of the operating mode:

- Limited Export at the PCC- The power control system controls the amount of real power that is exchanged across the point of common coupling with the Area EPS.
- Limited DER Output Capacity- The power control system controls the amount of real power that the DER is capable of outputting at the point of connection, behind the IC's side of the point of common coupling with the Area EPS.
- Import Only - The power control system prevents the DER from exporting real power across the point of common coupling with the Area EPS. This restriction may be placed on a single DER within a system of multiple DER, such as only on an energy storage system while allowing PV to export, or may be placed on all DER behind a single point of common coupling with the Area EPS.

9.3. Documentation

When the DER implements the use of a power control system, it is generally to prevent export or limit export of a DER, control charging of an energy storage system, or limit the total DER capacity. The operating modes and control modes that the power control system may use are not typically certified to a national standard, and therefore need to be reviewed by the Utility to ensure compliance with applicable requirements of the Area EPS and/or BPS. When a review is required, there is often additional information that the IC needs to provide to the Utility. The following documentation shall be submitted as an attachment with the Interconnection Application when a power control system is being proposed:

a. Manufacturer and model of the power control system, or of the components that make up the power control system.
b. User manual of the power control system.
c. A control schematic of the power control system, showing instrumentation, sensors, breakers, and DER.
d. A listing of the operating modes and services that will be available in the power control system.
e. A listing of the operating modes and services that will be enabled.
f. A description of the operating modes, services, and any specific settings that are enabled, and how the hardware/software present in the design is used to accomplish the goals of each mode being used.
g. A description of how operating modes and services not being enabled are locked down to prevent unintentional enabling.
h. State the enabled operating mode, on the one-line diagram and interconnection application.
i. Additional information that may be requested by the Utility to clarify operation of the power control system.

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9.4. Inadvertent Export

Inadvertent export is the unscheduled and uncompensated flow of real power, through the point of common coupling and back into the Area EPS. Inadvertent export may occur during sudden changes in electrical demand on the Local EPS and must be quickly resolved through the automatic adjustment of the DER output through the direction of the DERs power control system.

Inadvertent export, if it is large enough, could cause tripping of protective devices and a resulting power outage. For DER systems which are designed as non-exporting, the Area EPS has not been constructed to support the reverse flow of energy and may not be able to support it.

Inadvertent export shall be limited to 10% of the DER nameplate rating or 100kW, whichever is less, for a maximum of 30 seconds. The cumulative amount of inadvertent exported energy from the Local EPS to the Area EPS, across the point of common coupling, in any billing month shall be less than the on-site aggregated DER Nameplate Rating(s) multiplied by one hour. The power control system shall be designed to limit inadvertent export to these levels, unless otherwise mutually agreed to between the Area EPS and the IC. Any amount of inadvertent export of real power across the point of common coupling lasting longer than 30 seconds for any single event shall result in the disconnection of the DER system from the Area EPS within two (2) seconds of exceeding the 30-second duration limit.

10. Interoperability

As DER penetration rises, there will be an increasing need to provide the Utility with ongoing indication of the DER production. There will be evolving requirements as the penetration rises in both facility size and functionality. Work is in progress for smart inverters and advanced interconnection and communication standards to facilitate this evolution. At high penetrations of DER, there will be a growing need to also provide control instructions to the inverters such as shifting to a different voltage control mode. The following is an overview of the requirements at the time this manual is published. The IC should verify the requirements as part of the application process.

10.1. Monitoring and Control Requirements

10.1.1. 20 kW to 250 kW

The Utility may require the ability to remotely monitor the output of small to medium size installations. This information is needed to quickly address Area EPS and BPS constraints and contingency conditions, as required by NERC reliability standards. This does not apply to facilities that qualify for closed load transition status. Monitoring of small DER may be done through an aggregator or Utility provided neighborhood collector.

The information required will vary by DER location and size, but all will include real and reactive power, voltage, and unit connection status. Whenever the IC is located in an Area EPS or BPS constrained region, generates power in excess of the Area EPS load, or is in an area with a high penetration of DER, this monitoring is more likely to be needed.

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The IC is expected to provide suitable space or enclosure for the installation of the monitoring and telemetry equipment. The cost of IC's site terminal equipment, any added metering, interface security device when needed, and ongoing communication channel costs to the designated Utility point of receipt is the IC's responsibility when telemetry is a condition of interconnection.

10.1.2. 250 kW to 1 MW

As DER penetration levels increase, the Utility will require the ability to remotely monitor the output of intermediate size installations as distribution control, safety, and power quality will require greater DER monitoring in addition to Utility provided feeder monitoring. This information is needed to quickly address Area EPS and BPS constraints and contingency conditions, as required by NERC reliability standards, which must be addressed quickly. This may not apply to facilities that qualify for closed load transition status.

The information required will vary by DER location and size, but all will include real and reactive power, voltage, energy production, and unit connection status at or faster than the designated scan intervals. Whenever the IC is located in an Area EPS or BPS constrained region, generates power in excess of the Area EPS load, or is in an area with a high penetration of DER, this monitoring will be needed.
The IC is expected to provide suitable space or enclosure for the installation of the monitoring and telemetry equipment. The cost of IC's site terminal equipment, any added metering, interface security device when needed, and ongoing communication channel costs to the designated utility point of receipt is the IC's responsibility when telemetry is a condition of interconnection.

10.1.3. 1 MW and Greater

DER facilities 1 MW-AC and greater are required to provide and pay for telemetry as part of the required system modifications. This includes the IC's site-end terminal equipment, any added metering, and interface security device when needed, and ongoing secure communication channel costs to the designated Utility point of receipt. This does not apply to facilities that qualify for closed or soft load transition status.

The information required may vary by DER location and size but all will include near real time active and reactive power, point of delivery voltage, connection status, and integrated energy. Near real time means samples every 5 seconds or less with less than one second delivery delay. Whenever the IC is located in an Area EPS or BPS constrained region, generates power far in excess of the Area EPS load, or is in an area with a high penetration of DER, more stringent monitoring and control may be needed. If the IC is located on a high penetration DER circuit, especially if it is capacity constrained, is likely to be required to have more extensive control.

Additional information may be required, either initially or later, such as ambient, wind speed, or solar intensity.

The Utility may require the ability to remotely disconnect or curtail the DER for installations 1 MW and larger. For some installations, a remote ability to change control modes, such as power factor setting,

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may be required. This will be determined during the facility review. This control is needed to quickly address Area EPS and BPS constraints and contingency conditions, as required by NERC reliability standards, which must be addressed quickly. If the IC does not provide a suitable device to be controlled, the Utility will install a suitable device on the feeder, at the IC's expense, to provide the control. The control of this device will be exercised in a non-discriminatory manner in compliance with the NERC standards. Interface with the inverters or the site controller is preferred as it provides more, and often less disruptive options.

The Utility either will provide the specifications for the equipment or the needed equipment, at cost, to the IC for the IC's site. The Utility will provide the equipment at the Utility's designated delivery location at Utility cost.

The IC is expected to provide suitable floor space or an enclosure in a suitable location.

The IC is to provide the secure communications channel to the Utility's dispatch facility or other designated location to provide the required communication path between the DER facility and the Utility. The Utility will define the needed minimum security, through-put, and latency requirements needed. This will be determined in the facility review.

Maintenance costs for telemetry related equipment at the IC's site is the responsibility of the IC.

10.2. Transfer Trip Considerations

Considerations for transfer trip are discussed in an earlier Section of this manual. The customer must work with the Utility to understand the design requirements for these systems.

10.3. Security Requirements

10.3.1. Physical Security

It is the responsibility of the IC to maintain physical security for equipment, communication, and control interfaces at the DER site. Front panel or local access to any protection, control or communication interfaces shall be password protected to allow only qualified personnel access.

10.3.2. Network Security

It is the IC's responsibility to ensure cyber security of any DER equipment or communication interfaces provided by the IC. The IC must assure there are now cyber connections with the internet and DER communication systems connected to the Utility. The communication link between any piece of equipment and the Utility shall be a direct link and not a shared communication channel with any other communication.

11. Energy Storage Systems

Various types of Energy Storage Systems (ESS) may be considered that connect in parallel to the Area EPS. Battery storage is common for DER applications where the primary benefit enables DER sources to

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be dispatched / adjusted upon request behind the meter. In these cases, the ESS is charged by the DG system to be available later to dispatch the stored energy when the DER facility is not generating. Customers may apply battery storage energy when the DER facility is not generating. Customers may apply battery storage where there is no DER facility to take electricity from the Area EPS as a load during off-peak times when rates are lower, store the electricity, and the use the behind the meter stored electricity during peak times when rates are higher.

ESS has the potential for significant effects on the load flow of the Area EPS and the overall dispatch characteristics of the system. An ESS can be complemented by "smart inverter" technology at the point of common coupling, which could also affect the Area EPS. Under such circumstances, it is critical to understand the operating characteristics of the ESS, including import and export times, as well as equipment power ratings and capabilities. Additional information may be required at the time of application for interconnection such as:

- Method of ESS connection whether:
    - ESS directly connected to the Area EPS
    - DER and ESS DC coupled
    - DER and ESS AC coupled
    - ESS on Utility line side of service point and revenue meter
    - ESS on load side of service point and Utility revenue meter with the premises load
- Sequence of operation for the charging and discharging capabilities of the ESS and the maximum ramp rate in watts/seconds.
- Non-UL 1741 listed inverters will require a utility grade intertie relay with the appropriate IEEE 1547 functions, settings, and islanding protection according to the Utility's requirements.
- Service configuration and revenue metering provisions shall meet the Utility's requirements.

12. Microgrids

Various types of microgrids may be considered that connect in parallel to the Area EPS. Microgrids may be particularly appropriate to address resiliency and reliability. The Utility's position is that when a community microgrid serves multiple customers (in contrast to a facility or campus-style microgrid serving a single customer such as a university or hospital), including residential customers, and operates with the surrounding electric distribution infrastructure, the Utility is in the best position to own and properly operate electric distribution facilities within the community microgrid for the public interest in terms of safety, reliability, and resiliency.

The Utility emphasizes the importance of the compliance of all microgrids with the safety requirements of applicable codes. The Utility electric distribution facilities connecting participants and users in community microgrids are delivered systems governed by the National Electrical Safety Code® (NESC) as

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adopted by the local jurisdictional authority. The individual customers connected to the community microgrid through the Utility's electric distribution facilities have premises wiring systems that are governed by both the NEC, as adopted by the local jurisdictional authority, and the Utility's own electric service rules for safety of user from the hazards of electricity.

The Utility must be able to control the isolation of a community microgrid at each point of common coupling with the Area EPS if the Utility is to be held accountable for the safety and reliability of service within such a microgrid. This isolation can be achieved by visible break disconnect switches, interrupting devices or a combination thereof which can be manually or remotely operated by the Utility. DERs may be permitted to automatically trip a microgrid point of common coupling isolation device in order to island the community microgrid; however, they should be blocked from closing such a device until authorized to do so by the Utility's control center. The control scheme that will disconnect and reconnect the community microgrid from the Area EPS must be permitted will each have their own complexities. As such, each community microgrid will require that specific protocols be developed to ensure that customer safety and the overall Area EPS safety and reliability are not in any way compromised.

Common microgrid DER interconnection equipment, protective system and microgrid controllers at the point of common coupling with the Area EPS are to be designed and operated according to the Utility's requirements and specifications as well as to applicable codes and industrial standards. These assets may be owned and operated by IC or third parties. Individual DER facilities interconnections for connecting to the Area EPS in a microgrid shall comply with all applicable requirements identified within the manual.

13. Metering Requirements

The Utility will own, operate, and maintain all billing metering installations.

Typically, secondary metering will be used when the Utility owns the interconnecting transformer and primary metering will be used when the IC owns the interconnecting transformer. In some cases, the Utility may agree to meter on the secondary side of an IC owned transformer. In this case, the IC must provide transformer test reports, and any other related conductor or bus information so that the Utility can calculate and apply a "loss compensation" through the transformer.

The IC shall always provide the Utility access to the premises to install, maintain, and remove metering equipment. The IC may, at its option, have a representative witness work on the metering equipment by the Utility.

The metering installation shall be constructed in accordance with the practices, which normally apply to the construction of metering installations for residential, commercial, or industrial customers. For facilities with multiple DER installations, metering for each DER may be required. When practical, multiple DER installations may be metered at a common point provided the metering quantity represents only the gross DER output.

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The Utility will supply the IC all required metering equipment and specifications and requirements relating to the location, construction, and access of the metering installation. The Utility will also provide consultations pertaining to the meter installation requirements as required.

The responsibility for installation of the equipment is shared between the Utility and the IC. The IC may be required to install some of the metering equipment on its side of the point of common coupling., including instrument transformers, cabinets, conduits, and mounting surface. All metering equipment must meet the Utility's specifications and requirements.

The Utility will install the meter and communication connections.

Submetering associated with load control and special rate programs may not be permissible with certain DER applications. It is the responsibility of the IC to verify if the Utility's load control and special rate policies allow DER installations. If these policies do not, it may be the IC's responsibility to remove and rewire existing submetering.

14. Signage and Labeling

All signage and Labeling shall meet the applicable NEC requirements including:

- NEC 110.21 (B)
- NEC 690.13 (B)
- 705.10

14.1. Utility AC Disconnect

The Utility AC disconnect shall be labeled as "Utility AC Disconnect".

If a single Utility AC Disconnect cannot be used to disconnect all DERs, all Utility AC Disconnects shall include numerical identification such as "Utility AC Disconnect 1 of 2" or similar. The number of disconnects required to be operated to isolate the DER from the Area EPS shall be clear.

14.2. Main Meter

A sign at the main service meter shall indicate that DER is present. Each type of DER present shall be listed (i.e. PV, Wind, Energy Storage System, Gas Generator). The sign shall provide clear direction to the distance and location of all DER Utility AC Disconnects. A map shall include outline of all structures in the area and compass arrow for orientation.

14.3. Production Meter

The production meter shall be labeled as "Production Meter". When multiple production meters exist, each production meter shall be labeled in a manner that identifies which DER is being metered. Ownership of Production Meter shall be indicated.

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15. Test and Verification Requirements

To assure the safety and reliability, testing and commissioning requirements and procedures set forth in this document must be followed.

15.1. UL 1741 Type Testing.

The interconnection process allows for certification of DER equipment. This certification is recognized as UL 1741 for inverter-based DER. UL 1741 certification only applies to the inverter itself, while IEEE 1547 is applicable to the complete DER installation. Aggregated inverters, supplemental devices, such as ground reference banks, or additional protective relays may cause the system to be non-compliant with IEEE 1547. Additional review must be conducted to assure the complete systems compliance with IEEE 1547. Additional protective relays or equipment settings changes may be required to achieve compliance. For more complex systems a professional engineer may need to be consulted to evaluate compliance with IEEE 1547. Using UL 1741 certified inverters will reduce the scope of commissioning testing.

For inverter-based systems, non-UL 1741 certified inverters are not eligible for interconnection with the Area EPS. Three-phase systems made up of single-phase inverters not certified for use in a three-phase configuration are also not eligible for interconnection with the Area EPS.

The use of UL 1741 certified inverters does not automatically qualify the IC to be interconnected to the Area EPS. Non-UL 1741 certified DER still must meet the requirements of IEEE 1547 and this manual.

15.2. Certified Test Reports

A certified test report is a document that has been stamped as correct and complete by a Professional Engineer licensed to practice in the State of the DER installation. For units less than 250 kW, certification by a testing professional, such as NETA (InterNational Electrical Testing Association) or equivalent, will be accepted. Other testing documentation may be accepted at the sole discretion of the Utility.

15.3. Witness Testing

IC are to demonstrate the correct operation and functionality of the interface protective devices. Only a simple, operation demonstration may be needed for small, certified interconnection packages. Some additional demonstration for larger or multiple certified packages may be required.

For larger facilities, especially where non-certified interface equipment is used, Customers must provide qualified electricians, technicians, and operators, as needed, to perform the demonstrations. The Customer must supply all personal protective equipment (PPE) required and designate any procedures necessary to ensure that appropriate safety precautions are taken while working near energized equipment. For large, complex facilities, the Utility may require a written commissioning plan prior to the testing date.

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The scheduling of this demonstration should be coordinated to comply with the time frames specified by the Utility. The Utility may need to schedule multiple parties to participate in the witnessing. Where the facilities are large compared to the feeder capacity, special arrangements such as temporary field switching may be needed. Coordination with feeder maintenance and construction may be required, which may delay commissioning completion. Based on the size and type of DER at the site, the Utility may require only a design and relay setting review and not a site visit. This is to be determined by the Utility.

15.4. Equipment Commissioning Tests (Pre-Energization)

- Instrument Transformer Tests – CTs (Current Transformers) and VTs (Voltage Transformers) must be checked to verify proper wiring, polarity, and ratios. The installation should be checked against the design drawings approved by the Utility. CT's should be visually inspected to make sure shorting screws have been removed where required.
- Breaker and Switch Tests – Verify any interlocks between breakers and switches are functioning as designed. Verify any remote/local control or enable/disable control circuits or logic are functioning as designed. These verifications should be done by functional testing
- Trip Checks – Protective relay control circuits shall be functionally tested to ensure correct operation. The complete system should be tested by means of current or voltage injection to trigger an expected relay operation. Verify the relay operation trips the correct breaker, lockout or other protective or control element. The trip circuits shall be functionally verified from the correct relay operation to the breaker tripping. For inverters, UL1741 certification is adequate for the internal inverter functions.
- Remote Control and Monitoring – All remote control and monitoring SCADA points shall be verified operational. Analog points that are not able to be verified prior to energization may be verified at energization.
- Grounding – Shall be verified to ensure that it complies with the grounding requirements identified earlier in this manual, in addition to the NESC and NEC.
- Phase Rotation – The interconnection customer should work with the Utility to ensure proper phase rotation of the DER and wiring. UL 1741 certified inverters that do not intentionally island are not required to perform this test.
- Synchronizing Test – A pre-energization functional test demonstrating the DER paralleling-device will not allow closer if frequency, voltage, and phase angle are outside of the ranges required in IEEE-1547. For UL 1741 certified inverters, this test may not be required unless the inverter creates voltages for micro-grid or intentional Island operation.

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15.5. Commissioning Tests (Energization)

The Following tests will proceed once the DER has completed the pre-energization testing and the results have been approved by the Area EPS. As-built drawings, inverter settings, relay settings, and other calculations and information shall be provided to the Utility prior to the scheduled witness test. All energized commissioning tests shall be based on written test procedures agreed to between the Utility and the IC.

The following steps will be a minimum requirement:

- Verification of site Access – The site, and associated equipment, must have 24/7 unescorted access available to the Utility. This access should be drivable and keyless.
- As-built Verification – Verification that the installation matches the approved as-built one-line diagrams.
- Labeling Verification – The labeling must be meet the requirements of this manual.
- Remote Control and Monitoring – Any testing of the SCADA systems that could not be done prior to energization should be done at this stage.
- Anti-Islanding Test – Compliance with IEEE-1547 should be verified with the following steps. IEEE 1547.1 shall be referenced for evaluation of acceptable testing procedures.

    a) The DER system shall be started and connected in parallel with the Area EPS source.

    b) The Area EPS source shall be removed by opening a switch, breaker etc.

    c) The DER system shall either separate with the local load or stop generating within 2 seconds.

    d) The device that was opened to remove the Area EPS source shall be closed and the DER system shall not re-parallel with the Area EPS for at least 5 minutes or per a mutually agreed upon enter service time.

15.6. Final System Sign-off

To ensure the safety of the public, all DER systems greater than 250 kW, and all DER systems of any size which are not UL 1741 certified, shall be certified as ready to operate by a Professional Engineer registered in the same state as the DER installation, prior to the installation being considered ready for commercial use. This certification shall be provided with the certified test report submitted to the Utility.

15.7. Periodic Testing and Record Keeping

Refer to the Operations Section of this manual.

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16. Sample Documents

Sample one-line diagrams are attached at the end of this manual. Samples include:

- Figure 1 – Certified inverter interconnection packages < 20 kW
- Figure 2 – Non-certified interconnections < 20 kW
- Figure 3 – Non-certified interconnections between 20 kW and < 250 kW
- Figure 4 –Certified interconnection packages between 20 kW and < 250 kW
- Figure 5 – Non-certified interconnections between 250 kW and < 1 MW
- Figure 6 –Certified interconnection packages between 250 kW and < 1 MW

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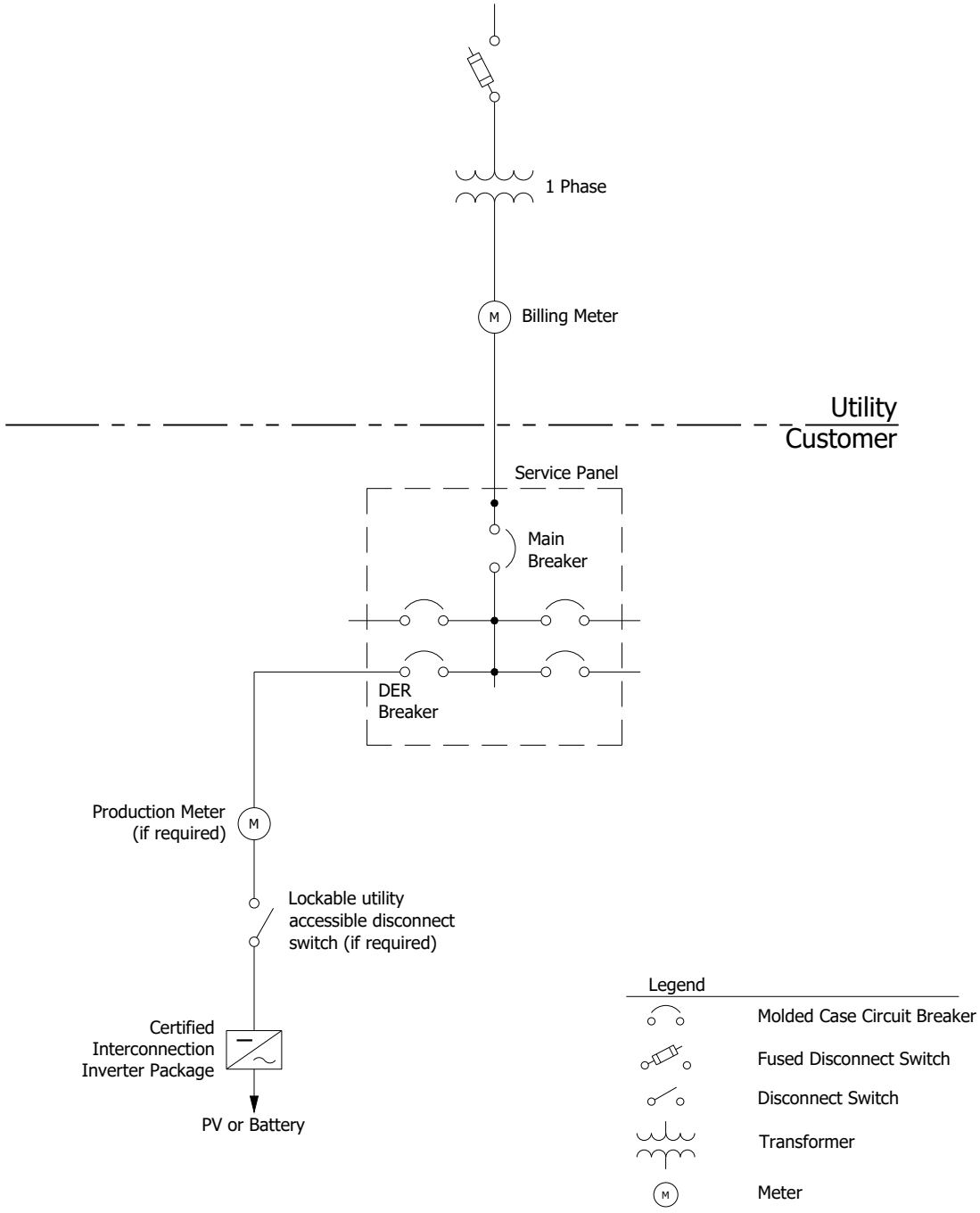

Power System Engineering, Inc.

Sample One-Line Diagram for Certified Inverter Package Installations

Less than 20kW

(Figure 1)

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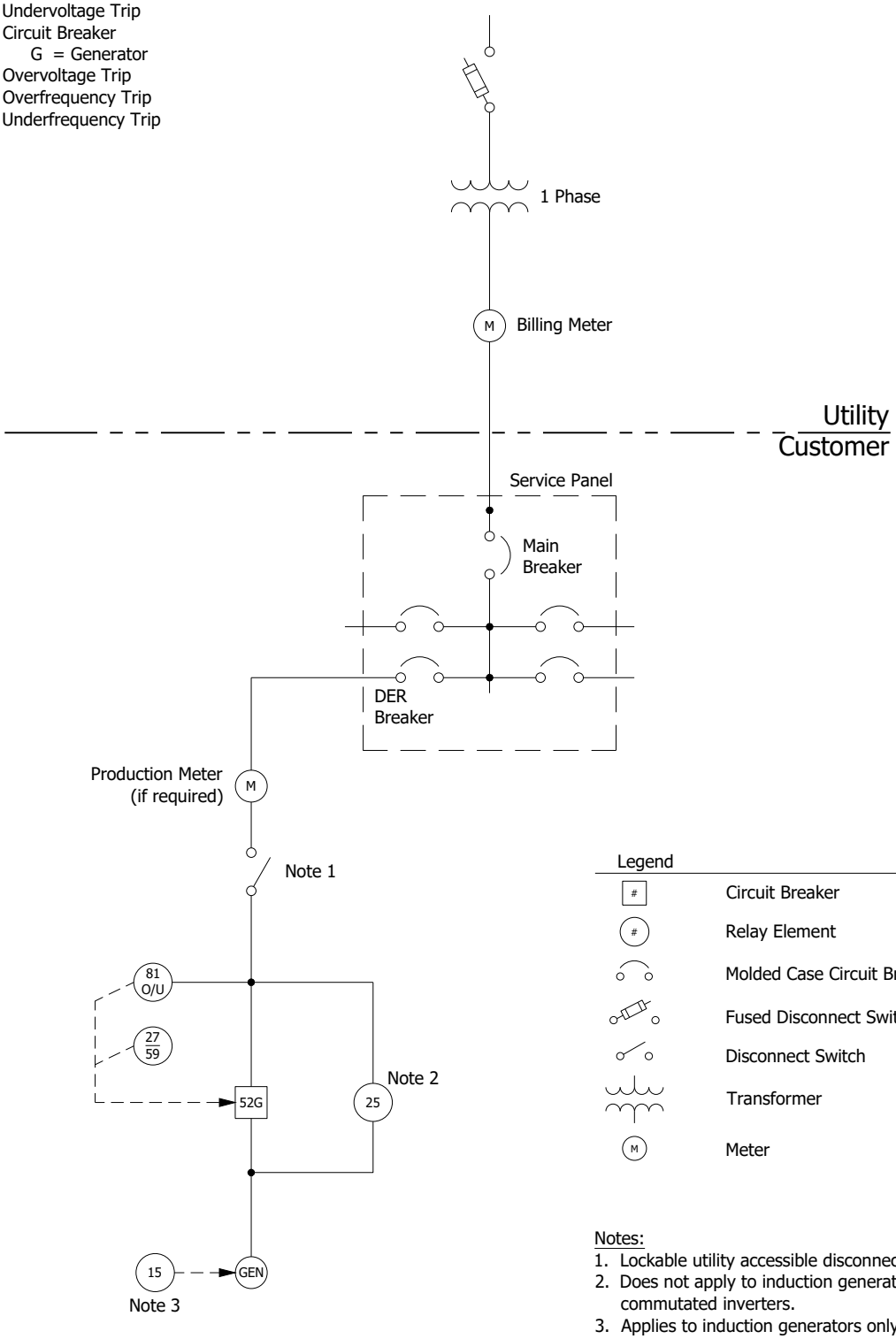
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

Relay Elements

15	Speed Matching
25	Synchronizer
27	Undervoltage Trip
52	Circuit Breaker
	G = Generator
59	Overvoltage Trip
81-O	Overfrequency Trip
81-U	Underfrequency Trip



Legend

#	Circuit Breaker
#	Relay Element
	Molded Case Circuit Breaker
	Fused Disconnect Switch
	Disconnect Switch
	Transformer
M	Meter

Notes:

1. Lockable utility accessible disconnect switch.
2. Does not apply to induction generators or line commutated inverters.
3. Applies to induction generators only.
4. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.
5. All relays shall be utility grade.

Power System Engineering, Inc.

Sample One-Line Diagram for DER Interconnection

Less than 20kW

(Figure 2)

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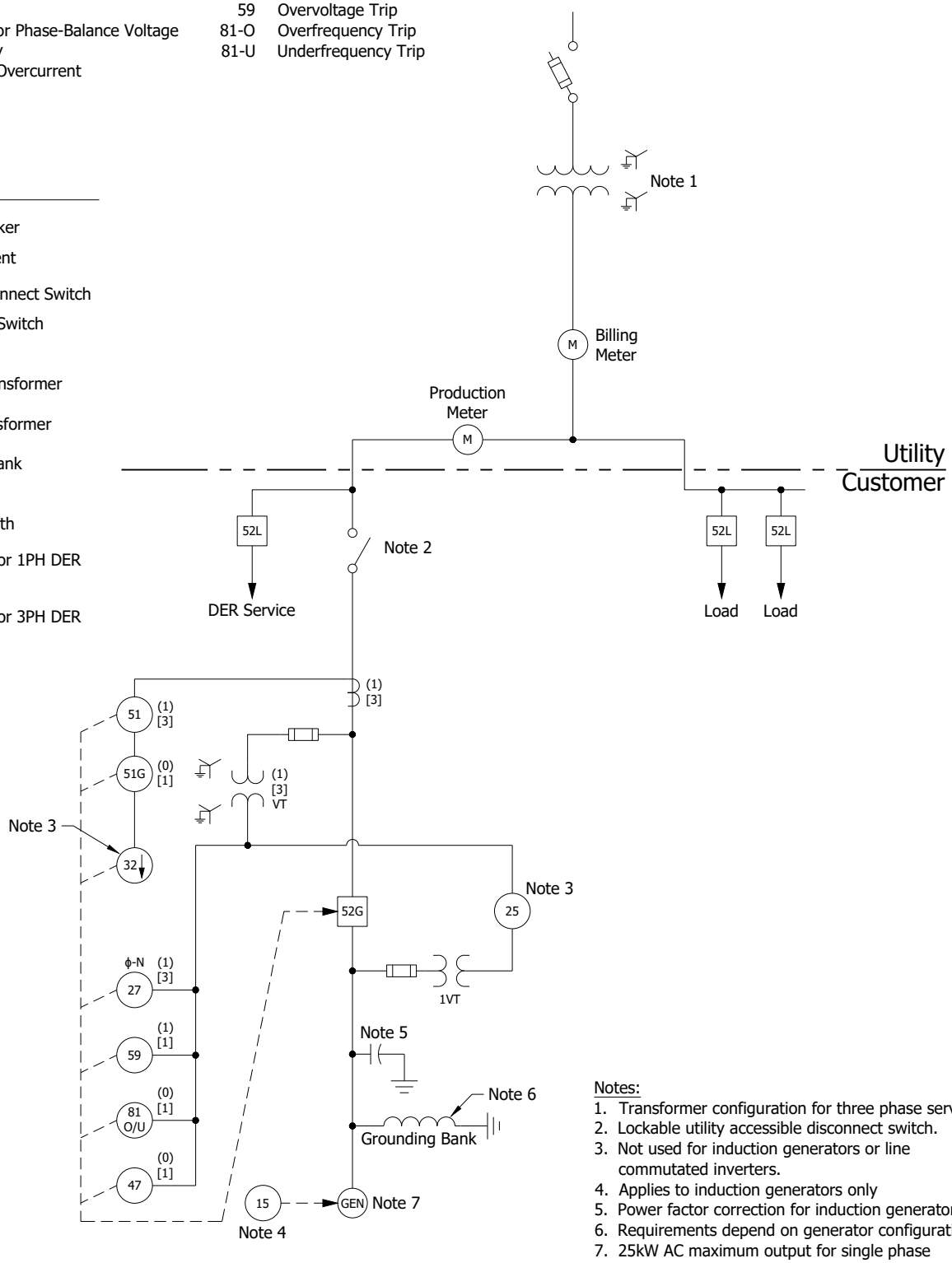
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	81 KI	ESS	None

Relay Elements

15	Speed Matching	52	Circuit Breaker
25	Synchronizer		L = Load
27	Undervoltage Trip		G = Generator
32	Reverse Power	59	Overvoltage Trip
47	Phase-Sequence or Phase-Balance Voltage	81-O	Overfrequency Trip
51	Overcurrent Relay	81-U	Underfrequency Trip
51G	Residual Ground Overcurrent		

Legend

#	Circuit Breaker
#	Relay Element
	Fused Disconnect Switch
	Disconnect Switch
	Fuse
	Voltage Transformer
	Power Transformer
	Capacitor Bank
M	Meter
	Ground, earth
(#)	Quantities for 1PH DER applications
[#]	Quantities for 3PH DER applications



Notes:

1. Transformer configuration for three phase service.
2. Lockable utility accessible disconnect switch.
3. Not used for induction generators or line commutated inverters.
4. Applies to induction generators only
5. Power factor correction for induction generators.
6. Requirements depend on generator configuration.
7. 25kW AC maximum output for single phase applications.
8. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.

Power System Engineering, Inc.

Sample One-Line Diagram for DER Interconnection

20kW to less than 250kW

(Figure 3)

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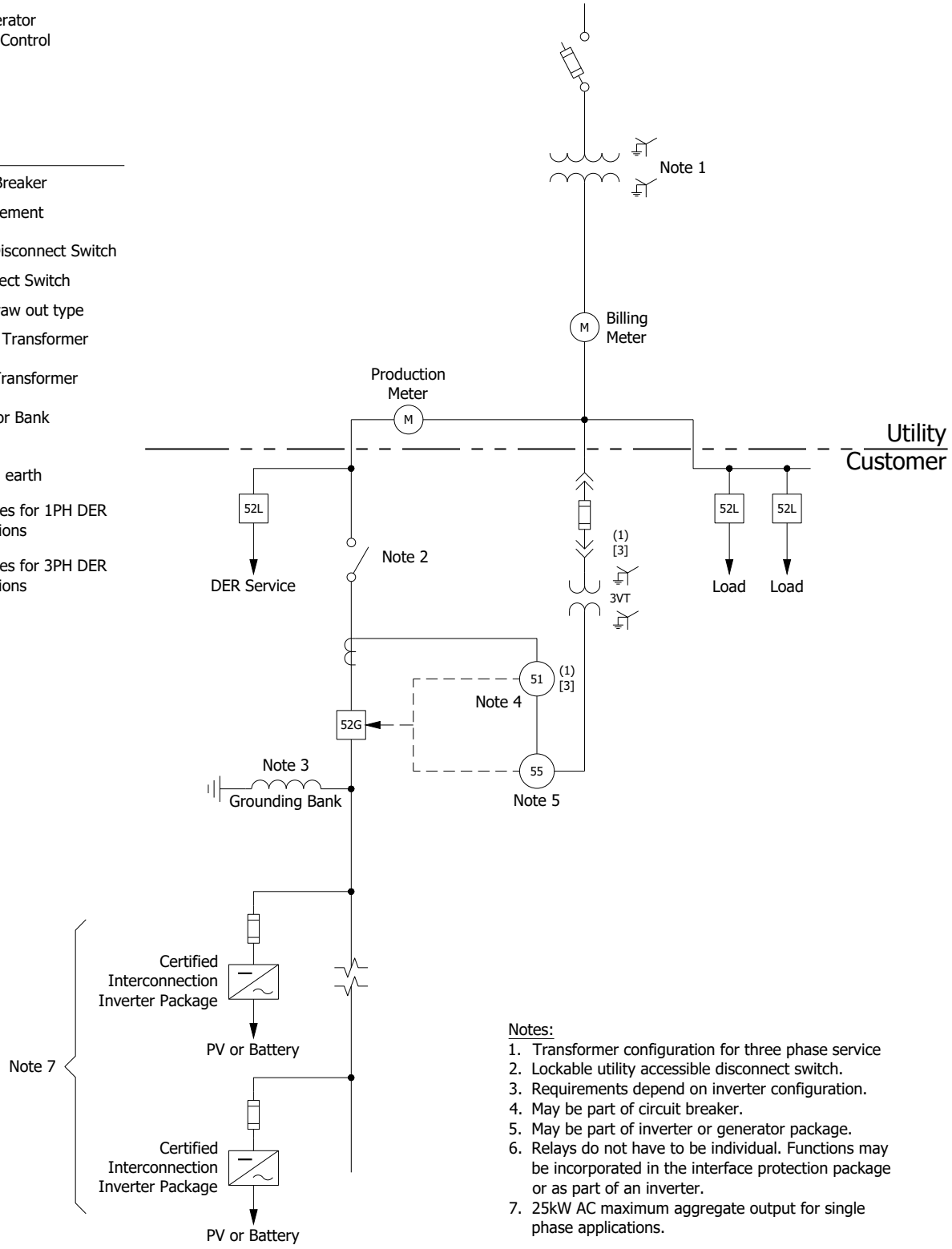
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

Relay Elements

25	Synchronizer
32	Reverse Power
51	Overcurrent Relay
52	Circuit Breaker
	L = Load
	G = Generator
55	Power Factor Control

Legend

#	Circuit Breaker
#	Relay Element
	Fused Disconnect Switch
	Disconnect Switch
	Fuse, draw out type
	Voltage Transformer
	Power Transformer
	Capacitor Bank
M	Meter
	Ground, earth
(#)	Quantities for 1PH DER applications
[#]	Quantities for 3PH DER applications



Notes:

1. Transformer configuration for three phase service
2. Lockable utility accessible disconnect switch.
3. Requirements depend on inverter configuration.
4. May be part of circuit breaker.
5. May be part of inverter or generator package.
6. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.
7. 25kW AC maximum aggregate output for single phase applications.

Power System Engineering, Inc.

Sample One-Line Diagram for Certified Inverter Package Installations

20kW to less than 250kW

(Figure 4)

Return to Agenda

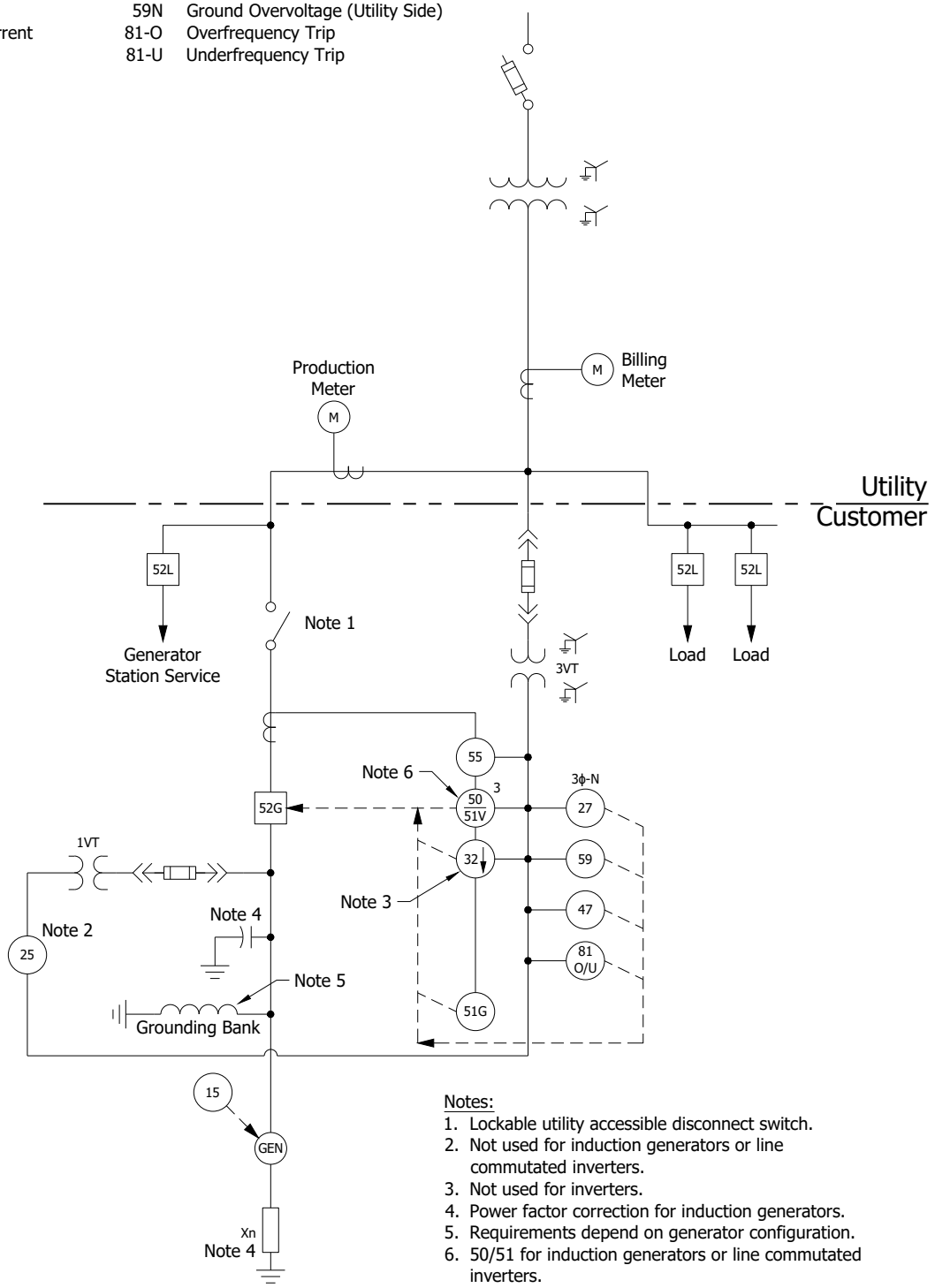
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

Relay Elements

15	Speed Matching for Induction Gen	52	Circuit Breaker
25	Synchronizer		L = Load
27	Undervoltage Trip		T = Transformer
32	Reverse Power		G = Generator
47	Phase-Sequence or Phase-Balance Voltage	55	Power Factor/VAR Controller
50/51V	Voltage Controlled Time Overcurrent with Instantaneous, 1/Phase	59	Overvoltage Trip
		59N	Ground Overvoltage (Utility Side)
51G	Residual (Ground) Time Overcurrent	81-O	Overfrequency Trip
		81-U	Underfrequency Trip

Legend

Xn	Neutral Reactor
#	Circuit Breaker
#	Relay Element
	Fused Disconnect Switch
	Disconnect Switch
	Fuse, draw out type
	Potential Transformer
	Transformer
	Capacitor Bank
M	Meter
	Ground, earth



Notes:

1. Lockable utility accessible disconnect switch.
2. Not used for induction generators or line commutated inverters.
3. Not used for inverters.
4. Power factor correction for induction generators.
5. Requirements depend on generator configuration.
6. 50/51 for induction generators or line commutated inverters.
7. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.
8. All relays shall be utility grade.

Power System Engineering, Inc.

Sample One-Line Diagram for DER Interconnection

250kW to less than 1MW

(Figure 5)

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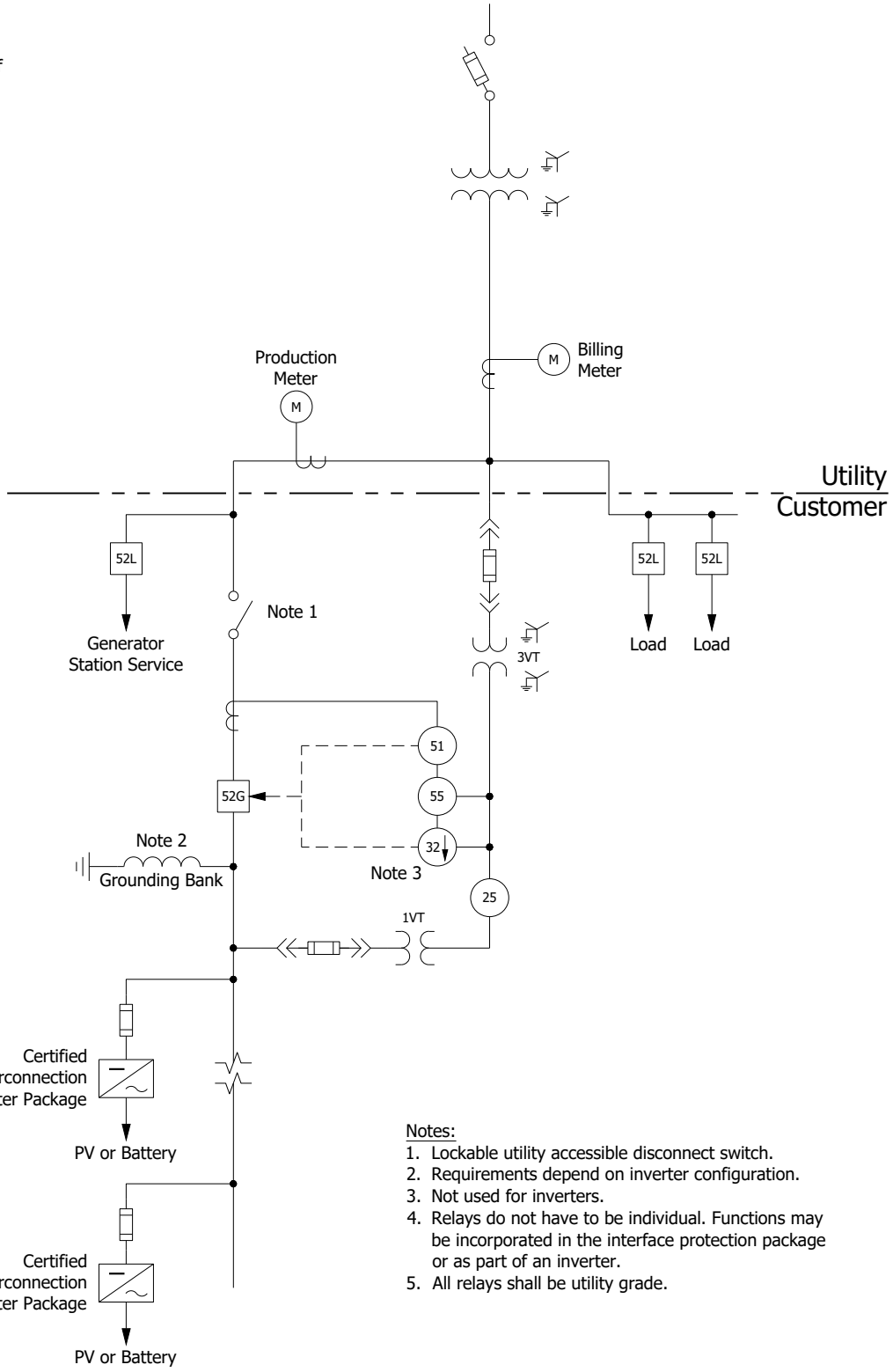
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

Relay Elements

- 25 Synchronizer
- 32 Reverse Power
- 51 Overcurrent Relay (May be part of 52)
- 52 Circuit Breaker
  - L = Load
  - T = Transformer
  - G = Generator
- 55 Power Factor Control (May be part of Inverter or Generator package)

Legend

- Circuit Breaker
- Relay Element
- Fused Disconnect Switch
- Disconnect Switch
- Fuse, draw out type
- Potential Transformer
- Transformer
- Capacitor Bank
- Meter
- Ground, earth



Notes:

1. Lockable utility accessible disconnect switch.
2. Requirements depend on inverter configuration.
3. Not used for inverters.
4. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.
5. All relays shall be utility grade.

Power System Engineering, Inc.

Sample One-Line Diagram for Certified Inverter Package Installations

250kW to less than 1MW

(Figure 6)

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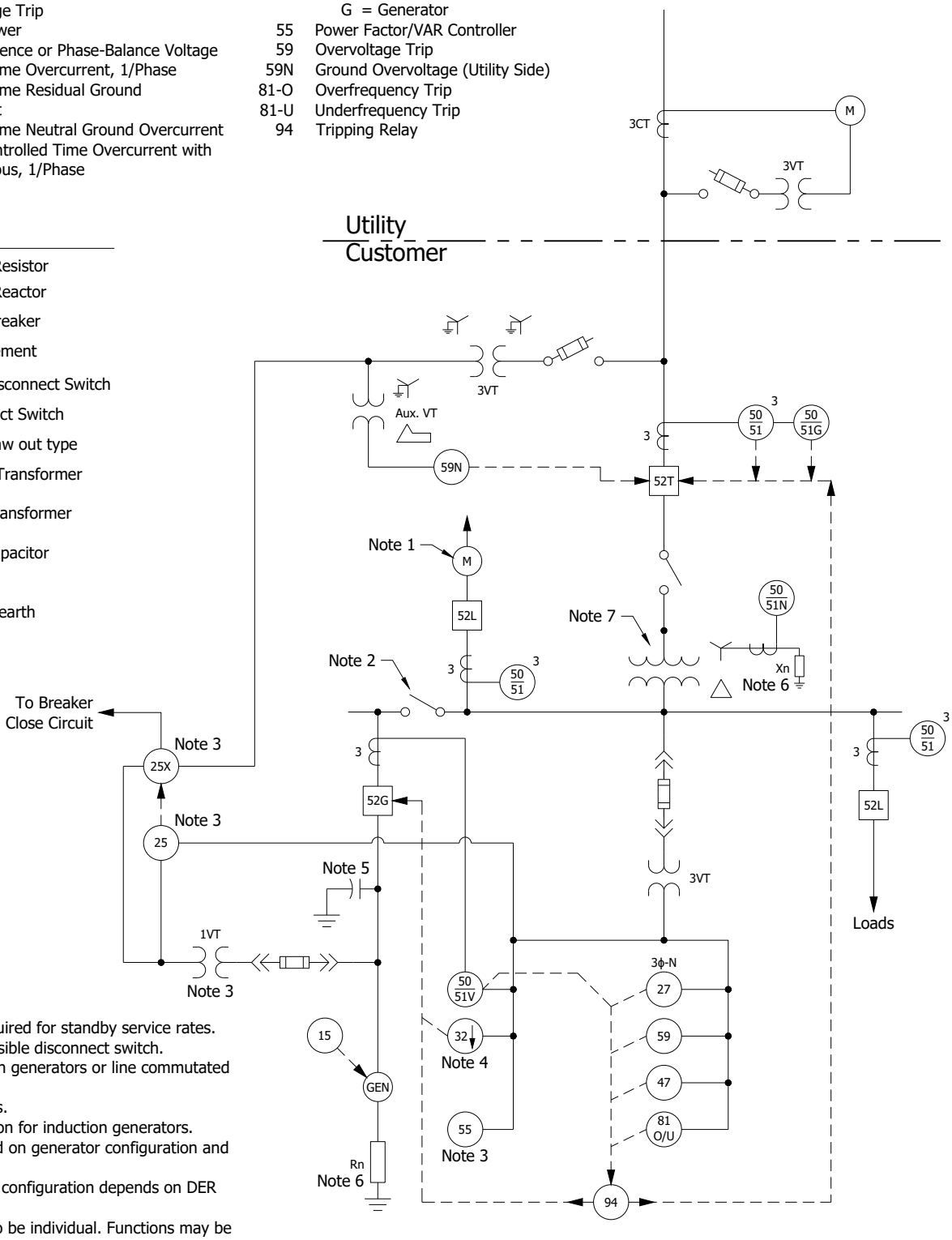
DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

Relay Elements

15	Speed Matching for Induction Gen
25	Synchronizer
25X	Sync Check
27	Undervoltage Trip
32	Reverse Power
47	Phase-Sequence or Phase-Balance Voltage
50/51	Inst. and Time Overcurrent, 1/Phase
50/51G	Inst. and Time Residual Ground Overcurrent
50/51N	Inst. and Time Neutral Ground Overcurrent
50/51V	Voltage Controlled Time Overcurrent with Instantaneous, 1/Phase
52	Circuit Breaker L = Load T = Transformer G = Generator
55	Power Factor/VAR Controller
59	Overvoltage Trip
59N	Ground Overvoltage (Utility Side)
81-O	Overfrequency Trip
81-U	Underfrequency Trip
94	Tripping Relay

Legend

Rn	Neutral Resistor
Xn	Neutral Reactor
#	Circuit Breaker
#	Relay Element
	Fused Disconnect Switch
	Disconnect Switch
	Fuse, draw out type
	Voltage Transformer
	Power Transformer
	Shunt Capacitor
M	Meter
	Ground, earth



Notes:

1. Metering may be required for standby service rates.
2. Lockable utility accessible disconnect switch.
3. Not used for induction generators or line commutated inverters.
4. Not used for inverters.
4. Power factor correction for induction generators.
5. Requirements depend on generator configuration and step-up transformer.
6. Transformer winding configuration depends on DER facility design.
7. Relays do not have to be individual. Functions may be incorporated in the interface protection package or as part of an inverter.
8. Production meters telemetry is not shown.
9. All relays shall be utility grade.
10. Design must meet the DER Technical Standards.

Power System Engineering, Inc.

Sample One-Line Diagram for DER Interconnection

1MW to less than 10MW

(Figure 7)

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DATE:	DRAWN BY:	APPROVED BY:	SCALE:
06/24/2020	KI	ESS	None

DRAFT

Distributed Energy Resource (DER)
Interconnection Study Agreement

THIS AGREEMENT is made and entered into this_____day of_____20 by and between_____a_____organized and existing under the laws of the State of_____, ("Interconnection Customer"), and the City of Sturgis, a Municipal corporation existing under the laws of the State of Michigan, ("City"). Interconnection Customer and City each may be referred to as a "Party", or collectively as the "Parties".

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Distributed Energy Resource (DER), or generating capacity addition to an existing DER, consistent with the Interconnection Application Form submitted by the Interconnection Customer, signed and dated on_____, 20 ; and,

WHEREAS, the Interconnection Customer desires to interconnect the DER with the City's electric distribution system; and,

WHEREAS, the Interconnection Customer has requested the City to perform a DER Interconnection Study which includes: 1) a system impact study to assess the impact of interconnecting the DER with the City's electric distribution system; and, 2) a subsequent facility study to identify the necessary distribution system modifications, and associated costs, required to accommodate the interconnection.

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1. The Interconnection Customer elects and the City shall cause to be performed a DER Interconnection Study consistent with industry standards and good utility practices.

2. The DER Interconnection Study will be based upon the technical information within the Interconnection Application provided by the Interconnection Customer. The City reserves the right to request additional technical information from the Interconnection Customer as may reasonably become necessary and consistent with industry standards and good utility practices during the course of the DER Interconnection Study.

3. The DER Interconnection Study, as necessary, may consist of a short circuit analysis, a stability analysis, a power flow analysis, voltage drop and flicker analysis, protection and set point coordination analysis, and grounding reviews. The study shall state the assumptions upon which it is based, state the results of the analyses and identify the necessary distribution system modifications, and associated costs, required to accommodate the interconnection. The costs identified in the study are non-binding good faith estimates.

4. If the City uses a queuing procedure for sorting or prioritizing DER interconnection projects and their associated cost responsibilities for any required distribution system modifications, the DER Interconnection Study shall consider all DER that, on the date the study is commenced:

    a. Are directly interconnected with the City's electric distribution system; and,

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b. Have a pending higher queued Interconnection Application to interconnect with the City's electric distribution system.

5. The City shall provide the results of the DER Interconnection Study to the Interconnection Customer in the form of a formal report sealed by a Professional Engineer licensed by the State of Michigan.

6. **Deposit.** A deposit equal to the good faith estimated cost of a DER Interconnection Study shall be required from the Interconnection Customer when the signed Agreement is provided to the City. If the deposit exceeds the study costs, the City shall refund such excess within 20 business days of receiving the final study invoice without interest. Any study costs that exceed the deposit will be invoiced to the Interconnection Customer within 20 business days after the study is delivered. The Interconnection Customer must pay any study costs the exceed the deposit without interest within 20 business days of receipt of the invoice.

7. **Governing Laws.** This Agreement shall be interpreted, governed, and construed under the laws of the State of Michigan.

8. **Amendment.** The Parties may amend this Agreement by a written instrument duly executed by both Parties.

9. **No Third-Party Beneficiaries.** This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

10. **Waiver.** The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

    Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the City. Any waiver of this Agreement shall, if requested, be provided in writing.

11. **Subcontractors.** Nothing in this Agreement shall prevent either Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain liable to the other Party for the performance of such subcontractor.

    The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the City be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

    The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

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12. **Breach and Default.** A breach of this Agreement ("Breach") shall occur upon the failure of a Party to perform or observe any material term or condition of this Agreement. Upon a Breach by one Party, the non-breaching Party shall give written notice of such Breach to the Breaching Party. The Party in Breach shall have 30 days from the date of the written notice to cure the Breach. If a Breach is not cured within the 30-day period provided for herein, the Party in Breach shall be deemed in default ("Default"). The non-defaulting Party shall then have the right to terminate this Agreement by written notice, shall be relieved of any further obligations hereunder, and may pursue any and all remedies available to it at law or in equity.

13. **Assignment and Binding Effect.** This Agreement shall not be assigned by a Party without the prior written consent of the other Party. Any attempt to do so will be void. Subject to the proceeding, this agreement is binding upon, inures to the benefits of, and is enforceable by the Parties and their respective successors and assigns. The Interconnection Customer agrees to notify the City in writing upon the sale or transfer of the DER facilities. This Agreement shall terminate upon such notice unless the City consents to an assignment.

14. **Terms of Agreement and Termination.** This Agreement shall become effective upon execution by all Parties and it shall continue in full force and effect until terminated upon thirty (30) days' prior notice by either Party if the Agreement is terminated: (1) pursuant to Section 12, (2) upon mutual agreement of the Parties, or (3) upon a change in ownership of the DER facility, absent a valid assignment under Section 13. In the event of termination, the Interconnection Customer shall pay City for all DER Interconnection Study costs rendered to the date of termination.

15. **Severability.** If any of this Agreement is determined to be partially or wholly invalid, illegal, or unenforceable, then such provision shall be deemed to be modified or restricted to the extent necessary to make such provision valid, binding, and enforceable; or, if such provision cannot be modified or restricted in a manner so as to make such provision valid, binding or enforceable, then such provision shall be deemed to be excised from this Agreement and the validity, binding effect, and enforceability of the remaining provisions of this Agreement shall not be affected or impaired in any manner.

16. **Notices.** Any notice required under this Agreement shall be in writing and mailed, emailed, or personally delivered to the Party at the address below. Personal notices are effective upon delivery, or within 3 business days of depositing the notice in the United States mail with first class postage. Written notice of any address changes shall be provided. All written notices shall be directed as follows:

Notice to City	Notice to Interconnection Customer
City of Sturgis	_____
Attn: Electric Superintendent	Attn:_____
130 N. Nottawa	_____
Sturgis, MI 49091	_____
Tel. (269) 651-2321	Tel. _____

17. **Entire Agreement.** This Agreement supersedes all prior discussions and agreements between the Parties with respect to the subject matter hereof and constitutes the entire agreement between the Parties hereto.

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IN WITNESS THEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

City of Sturgis

Signature:_____ Date:_____

Printed Name: _____

Interconnection Customer

Signature:_____ Date:_____
(Authorized Agent of the Legal Entity)

Printed Name: _____

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DRAFT

Distributed Energy Resource (DER)
Interconnection and Operating Agreement

THIS AGREEMENT is made and entered into this _____ day of _____ 20_____ by and between _____ a _____ organized and existing under the laws of the State of _____, ("Interconnection Customer"), and the City of Sturgis, a Municipal corporation existing under the laws of the State of Michigan, ("City"). Interconnection Customer and City each may be referred to as a "Party", or collectively as the "Parties".

RECITALS

WHEREAS, the Interconnection Customer is in good standing with the City; and,

WHEREAS, the Interconnection Customer desires to interconnect and operate in parallel a Distributed Energy Resource (DER) with the City's electric distribution system; and,

WHEREAS, for the purpose of this Agreement, "interconnection" means establishing an electrical connection between a DER and the City's electric distribution system. "Operate in parallel" means generating electricity from a DER that is electrically connected to the City's electric distribution system; and,

WHEREAS, the interconnection of the DER with the City's electric distribution system is subject to this Agreement, the corresponding Interconnection Application, the corresponding Interconnection Study Agreement and Interconnection Study Results, Technical Specifications Manual, and other applicable industry standards; and,

WHEREAS, this Agreement does not address any purchase or sale of electricity between the City and the Interconnecting Customer nor does it create any agency, partnership, joint venture or other business arrangement between the City and the Interconnection Customer.

THEREFORE, in consideration of the above recitals, the mutual covenants contained herein and for good and valuable consideration, the Parties agree as follows:

AGREEMENT

1. **DER Interconnection Information**

   A. The DER is built within the following type and ratings which will not be changed without thirty (30) days advance written notice to the City according to the notice requirements herein:

      i. Single or Three Phase Service: _____

      ii. Type of DER System: _____

      iii. Nameplate Rating of DER System: _____ kW-AC

      iv. Address of DER System: _____

   B. The DER is planned to be ready for parallel operation on or about: _____

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2. **Definitions**

A. Affected System – Another customer's electric system connected with the City's electric distribution system, another DER connected with the City's electric distribution system, the Transmission System, or Transmission System connected generation which may be affected by the proposed DER interconnection.

B. Emergency Condition – A condition or situation that is imminently likely to endanger life or property, cause a material adverse effect on the security of the City's electric distribution system or Affected System, cause damage to the City's electric distribution system or Affected System, or cause damage to the Interconnected Customer's DER or electric system.

C. Good Utility Practice – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and act which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. Good Utility Practices is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

D. Interconnection Facilities – Collectively, Interconnection Facilities include all facilities and equipment between the DER and City's electric distribution system.

E. Material Modification – A modification to equipment settings, equipment configuration or to the interconnection site of the DER at any time after receiving notification by the City of a complete Interconnection Application that has a material impact on the cost, timing, or design of any Interconnection Facilities or Upgrades, or a material impact on the cost, timing or design of any subsequent Interconnection Application, or the safety or reliability of the City's electric distribution system.

F. Point of Common Coupling – The point where the Interconnection Facilities connect with the City's electric distribution system.

G. Transmission System – The facilities owned, leased, controlled or operated by the transmission provider or owner that are used to provide transmission services to the City.

H. Upgrades – The required additions and modifications to the City's electric distribution system or Transmission System. Upgrades do not include Interconnection Facilities.

3. **Scope and Limitations of Agreement**

A. This Agreement is intended to provide for the Interconnection Customer to interconnect at the PCC and operate a Distributed Energy Resource (DER) in parallel with the City's electric distribution system of the type, nameplate rating and location as described in Section 1.

B. This Agreement governs the terms and conditions under which the Interconnection Customer's DER will interconnect with, and operate in parallel with, the City's electric distribution system.

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C. This Agreement does not constitute an agreement to purchase or deliver the Interconnection Customer's energy. The purchase or delivery of energy and other services that the Interconnection Customer may require will be covered under separate agreements, if any. The Interconnection Customer will be responsible for separately making all necessary arrangements (including scheduling) for the delivery of electric energy to the City.

D. Nothing in this Agreement is intended to affect any other agreement between the City and the Interconnection Customer.

E. Responsibilities of the Parties

i. The Parties shall perform all obligations of this Agreement in accordance with the DER Technical Specifications Manual, all Applicable Laws and Regulations, Applicable Industry Standards, and Good Utility Practices.

ii. The Interconnection Customer shall construct, interconnect, operate and maintain its DER and construct, operate, and maintain its Interconnection Facilities in accordance with the applicable manufacturer's recommended maintenance schedule and, in accordance with this Agreement, and with Good Utility Practices.

iii. The City shall construct, operate, and maintain its electric distribution system and its Interconnection Facilities in accordance with this Agreement, and with Good Utility Practice.

iv. The Interconnection Customer agrees to construct its facilities or systems in accordance with the DER Technical Standards and this Agreement; including, applicable specifications that meet or exceed those provided by the National Electrical Safety Code, the American National Standards Institute, IEEE, Underwriter's Laboratory, and Operating Requirements in effect at the time of construction and other applicable national and state codes and standards. The Interconnection Customer agrees to design, install, maintain, and operate its DER so as to reasonably minimize the likelihood of a disturbance adversely affecting or impairing the system or equipment of the City's electric distribution system and any Affected Systems.

v. Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for the facilities that it now owns or subsequently owns. Each Party shall be responsible for the safe installation, maintenance, repair and condition of their respective lines and appurtenances on their respective sides of the Point of Common Coupling (PCC). The City and the Interconnection Customer, as appropriate, shall provide Interconnection Facilities that adequately protect the City's electric distribution system, personnel, and other persons from damage and injury. The allocation of responsibility for the design, installation, operation, maintenance and ownership of Interconnection Facilities shall be delineated at the PCC.

vi. The City shall coordinate with all Affected Systems to support the interconnection.

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F. Parallel Operation Obligations

Once the DER has been authorized to commence parallel operation, the Interconnection Customer shall abide by all rules and procedures pertaining to the parallel operation of the DER as identified by this Agreement and by the DER Technical Specifications Manual.

G. Metering

The Interconnection Customer shall be responsible for the City's reasonable and necessary cost for the purchase, installation, operation, maintenance, testing, repair, and replacement of metering and data acquisition equipment. The Interconnection Customer's metering (and data acquisition, as required) equipment shall conform to applicable industry standards.

H. DER Capabilities and Electric Distribution System Reliability

i. The DER Technical Specifications Manual outlines the Parties responsibilities consistent with IEEE 1547 Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces which provides requirements relevant to the interconnection and interoperability performance, operation and testing, and, to safety, maintenance and security considerations.

ii. The City may offer the Interconnection Customer the option to utilize required DER capabilities to mitigate Interconnection Customer costs related to Upgrades or Interconnection Facilities to address anticipated system impacts from the engineering review.

4. **Inspection, Testing, Authorization, and Right of Access**

A. Equipment Testing and Inspection

The Interconnection Customer shall test and inspect its DER and Interconnection Facilities prior to interconnection pursuant to the DER Technical Specifications Manual and this Agreement.

B. Authorization Required Prior to Parallel Operation

The City shall use reasonable efforts to list applicable parallel operation requirements by attaching the DER Interconnection Technical Requirements to this Agreement. Additionally, the City shall notify the Interconnection Customer of any changes to these requirements as soon as they are known. The Interconnection Customer shall not operate its DER in parallel with the City's electric distribution system without prior written authorization of the City.

C. Right of Access

i. Upon reasonable notice, the City may send a qualified person to the premises of the Interconnection Customer at or immediately before the time the DER first produces energy to inspect the interconnection and observe the commissioning of the DER (including any required testing), startup, and operation for a period of up to three (3) business days after initial start-up of the unit. In addition, the Interconnection Customer shall notify the City at least five (5) business days prior to conducting any on-site verification testing of the DER.

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ii. Following the initial inspection process described above, at reasonable hours, and upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition, the City shall have access to the Interconnection Customer's premises for any reasonable purpose in connection with the performance of the obligations imposed on it by this Agreement or if necessary to meet its legal obligation to provide service to its customers.

iii. Each Party shall be responsible for its costs associated with following this article as outlined in the DER Technical Specifications Manual.

5. **Effective Date, Term, Termination, and Disconnection**

A. This Agreement shall become effective upon execution by the Parties on the Effective Date and shall remain in effect from the Effective Date unless terminated earlier in accordance with this Agreement.

B. No termination shall become effective until the Parties have complied with all Applicable Laws and Regulations applicable to such termination.

C. Either Party may terminate this Agreement at any time by giving the other Party ninety (90) business day written notice.

D. Either Party may terminate this Agreement upon the Default of the other Party.

E. Upon termination of this Agreement, the DER will be disconnected from the City's electric distribution system. All costs required to effectuate such disconnection shall be borne by the terminating Party, unless such termination resulted from the non-terminating Party's Default or such non-terminating Party otherwise is responsible for these costs.

F. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.

G. The provisions of this article shall survive termination or expiration of this Agreement.

H. Temporary disconnections shall continue only for so long as reasonably necessary under Good Utility Practices.

i. Under Emergency Conditions, the City may immediately suspend interconnection service and temporarily disconnect the DER. The City shall use reasonable efforts to notify the Interconnection Customer promptly when it becomes aware of an Emergency Condition that may reasonably be expected to affect the Interconnection Customer's operation of the DER. The Interconnection Customer shall use reasonable efforts to notify the City promptly when it becomes aware of an Emergency Condition that may reasonably be expected to affect the City's electric distribution system or any Affected Systems. To the extent information is known, the notification shall describe the Emergency Condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

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ii. The City may interrupt interconnection service or curtail the output of the DER and temporarily disconnect the DER from the City's electric distribution system when necessary for routine maintenance, construction, or repairs on the City's electric distribution system. The City shall use reasonable efforts to provide the Interconnection Customer with three (3) business day notice prior to such interruption. The City shall use reasonable efforts to coordinate such reduction or temporary disconnection with the Interconnection Customer.

iii. During any forced outage, the City may suspend interconnection service to effect immediate repairs on the City's electric distribution system. The City shall use reasonable efforts to provide the Interconnection Customer with prior notice. If prior notice is not given, the City shall, upon request, provide the Interconnection Customer written documentation after the fact explaining the circumstances of the disconnection.

iv. The City shall notify the Interconnection Customer as soon as practicable if, based on Good Utility Practices, operation of the DER may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the DER could cause damage to the City's electric distribution system or Affected Systems. Supporting documentation used to reach the decision to disconnect shall be provided to the Interconnection Customer upon request. If, after notice, the Interconnection Customer fails to remedy the adverse operating condition in the timeframe in the notice, the City may disconnect the DER. The City shall provide the Interconnection Customer with a five (5) business day written notification of such disconnection, unless the disconnection is due to Emergency Conditions.

v. The Interconnection Customer must receive written authorization from the City before making any change to the DER that may have a material impact on the safety or reliability of the City's electric distribution system. Such authorization shall not be unreasonably withheld if the modification is not a Material Modification. Material Modifications, including an increase nameplate rating or capacity, may require the Interconnection Customer to submit a new Interconnection Application. If the Interconnection Customer makes such modification without the City's prior written authorization, the latter shall have the right to temporarily disconnect the DER.

vi. The Parties shall cooperate with each other to restore the DER, Interconnection Facilities, and the City's electric distribution system to their normal operating state as soon as reasonably practicable following a temporary disconnection.

vii. If the Interconnection Customer receives retail electrical service at the same site as the DER, it may also be disconnected consistent with the rules and practices for disconnecting other retail electrical customers.

viii. If the Interconnection Customer is in Default it may be disconnected after a sixty (60) day written notice is provided and the Default is not cured during this 60 day notice. This provision does not apply to disconnection based on Emergency Conditions.

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6. **Cost Responsibility for Interconnection Facilities and Distribution Upgrades**

A. The Interconnection Customer shall pay for the cost of the Interconnection Facilities itemized in the DER Interconnection Study performed by the City. The City shall provide a good faith cost estimate, including overhead, for the purchase and construction of its Interconnection Facilities and provide a detailed itemization of such costs. Costs associated with Interconnection Facilities may be shared with other entities that may benefit from such facilities by agreement of the Interconnection Customer, such other entities, and the City.

B. The Interconnection Customer shall be responsible for its share of all reasonable expenses, including overhead, associated with (1) owning, operating, maintaining, repairing, and replacing its own Interconnection Facilities, and (2) operating, maintaining, repairing, and replacing the City's Interconnection Facilities.

C. The City shall design, procure, construct, install, and own the distribution Upgrades. The City shall provide a good faith cost estimate, including overhead, for the purchase and construction of the distribution Upgrades and provide a detailed itemization of such costs. If the City and the Interconnection Customer agree, the Interconnection Customer may construct distribution Upgrades that are located on land owned by the Interconnection Customer. The actual cost of the distribution Upgrades, including overhead, shall be directly assigned to the Interconnection Customer.

7. **Billing, Payment, Milestones, and Financial Security**

A. The City shall bill the Interconnection Customer for the design, engineering, construction, and procurement costs of Interconnection Facilities and distribution Upgrades contemplated by this Agreement, and the Interconnection Customer shall pay each bill within thirty (30) days of such bill date.

B. Within eighty (80) business days (approximately 4 calendar months) of completing the construction and installation of the City's Interconnection Facilities and/or distribution Upgrades, City shall provide the Interconnection Customer with a final accounting report.

C. The Parties shall agree on milestones for which each Party is responsible.

D. The Interconnection Customer shall provide the City, at the Interconnection Customer's option, a guarantee, letter of credit or other form of security that is reasonably acceptable to the City. Such security for payment shall be in an amount sufficient to cover the costs for constructing, designing, procuring, and installing the applicable portion of the City's Interconnection Facilities and distribution Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to the City under this Agreement during its term. In addition:

i. The guarantee must be made by an entity that meets the creditworthiness requirements of the City and contain terms and conditions that guarantee payment of any amount that may be due from the Interconnection Customer, up to an agreed-to maximum amount.

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ii. The letter of credit must be issued by a financial institution or insurer reasonably acceptable to the City and must specify a reasonable expiration date not sooner than sixty (60) business days (three calendar months) after the due date for the issuance of the final bill.

8. **Insurance**

A. The City may require an Interconnection Customer to purchase insurance.

B. The City agrees to maintain general liability insurance or self-insurance consistent with the City's commercial practice. Such insurance or self-insurance shall not exclude coverage for the City's liabilities undertaken pursuant to this Agreement.

C. The Parties further agree to notify each other whenever an accident or incident occurs resulting in any injuries or damages that are included within the scope of coverage of such insurance, whether or not such coverage is sought.

D. Failure of the Interconnection Customer or City to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability.

9. **Governing Laws.** This Agreement shall be interpreted, governed, and construed under the laws of the State of Michigan.

10. **Consequential Damages.** Other than as expressly provided for in this Agreement, neither Party shall be liable under any provision of this Agreement for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to the other Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

11. **Force Majeure**. If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the Force Majeure Event (Affected Party) shall promptly notify the other Party, either in writing or via the telephone, of the existence of the Force Majeure Event. The notification must specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the Affected Party is taking to mitigate the effects of the event on its performance. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the Force Majeure Event until the event ends. The Affected Party will be entitled to suspend or modify its performance of obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of Reasonable Efforts. The Affected Party will use Reasonable Efforts to resume its performance as soon as possible.

12. **Default.** No Default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of a Force Majeure Event as defined in this Agreement or the result of an act or omission of the other Party. Upon a Default, the non-defaulting Party shall give written notice of such Default to the defaulting Party. The defaulting Party shall have 60 calendar days from receipt of the Default notice within which to cure such Default; provided however, if such Default is not capable of cure within 60 calendar days, the defaulting

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Party shall commence such cure within 20 calendar days after notice and continuously and diligently complete such cure within six months from receipt of the Default notice; and, if cured within such time, the Default specified in such notice shall cease to exist.

If a Default is not cured as provided in this article, or if a Default is not capable of being cured within the period provided for herein, the non-defaulting Party shall have the right to terminate this Agreement by written notice at any time until a cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates this Agreement, to recover from the defaulting Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this article will survive termination of this Agreement.

13. **Amendment.** The Parties may amend this Agreement by a written instrument duly executed by both Parties.

14. **No Third-Party Beneficiaries.** This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

15. **Waiver.** The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

    Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the City. Any waiver of this Agreement shall, if requested, be provided in writing.

16. **Subcontractors.** Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

    The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the City be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

    The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

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17. **Assignment and Binding Effect.** This Agreement shall not be assigned by a Party without the prior written consent of the other Party. Any attempt to do so will be void. Subject to the proceeding, this agreement is binding upon, inures to the benefits of, and is enforceable by the Parties and their respective successors and assigns. The Interconnection Customer agrees to notify the City in writing upon the sale or transfer of the DER facilities. This Agreement shall terminate upon such notice unless the City consents to an assignment.

18. **Terms of Agreement and Termination.** This Agreement shall become effective upon execution by all Parties and it shall continue in full force and effect until terminated. pursuant to Section 5

19. **Severability.** If any of this Agreement is determined to be partially or wholly invalid, illegal, or unenforceable, then such provision shall be deemed to be modified or restricted to the extend necessary to make such provision valid, binding, and enforceable; or, if such provision cannot be modified or restricted in a manner so as to make such provision valid, binding or enforceable, then such provision shall be deemed to be excised from this Agreement and the validity, binding effect, and enforceability of the remaining provisions of this Agreement shall not be affected or impaired in any manner.

20. **Indemnity and Liability.** Unless caused by the sole negligence or intentional wrongdoing of the other Party, each Party to this Agreement shall at all times assumed all liability for, and shall defend, hold harmless, and to the extent permitted by law, indemnify the other Party and its directors, officers, employees, and agents from, any and all damages, losses, claims, demands, suits, recoveries, costs, legal fees, and expenses: (a) for injury to or death of any person or persons whomsoever occurring on its own system, or (b) for any loss, destruction of or damage to any property of third persons, firms, corporations, or other entities occurring on its own system, including environmental harm or damage, or (c) arising out of or resulting form, either directly or indirectly, its own Interconnection Facilities, or (d) arising out of or resulting from, either directly or indirectly, any electric energy furnished to it hereunder after such energy has been delivered to it by such other Party. The provisions of this Section shall survive termination or expiration of this Agreement. Notwithstanding anything in this Section, or any other provision of this Agreement to the contrary, the City's indemnity obligations under this Section shall be effective if and only to the extent not prohibited by Applicable Law or by Governmental Immunity.

    The provisions of this Section shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance policy.

    Notwithstanding anything in this Section, or any other provision of this Agreement to the contrary, any liability of a Party to the other Party shall be limited to direct actual damages, and all other damages at law or in equity are hereby waived. Under no circumstances shall a Party be liable to the other Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits. The indemnification obligations and limits on liability in this Section shall continue in full force and effect notwithstanding the expiration or termination of this Agreement, with respect to any event or condition giving rise to an indemnification obligation that occurred prior to such expiration or termination.

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21. **Notices.** Any notice required under this Agreement shall be in writing and mailed, emailed, or personally delivered to the Party at the address below. Personal notices in effective upon delivery, or within 3 business days of depositing the notice in the United States mail with first class postage. Written notice of any address changes shall be provided. All written notices shall be directed as follows:

Notice to City	Notice to Interconnection Customer
City of Sturgis	_____
Attn: Electric Superintendent	Attn: _____
130 N. Nottawa	_____
Sturgis, MI 49091	_____
Tel. (269) 651-2321	Tel. _____

22. **Entire Agreement.** This Agreement supersedes all prior discussions and agreements between the Parties with respect to the subject matter hereof and constitutes the entire agreement between the Parties hereto.

IN WITNESS THEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

City of Sturgis

Signature: _____ Date: _____

Printed Name: _____

Interconnection Customer

Signature: _____ Date: _____
(Authorized Agent of the Legal Entity)

Printed Name: _____

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 10C

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PLANT GROWTH
MANAGEMENT SYSTEMS LLC.

P.O. Box 214, Niles, MI 49120
Phone:/Fax (269) 663-7467 Toll Free: 1-877-902-7467
Email: info@pgmstgr.com

September 16, 2020

City of Sturgis City Tree Maintenance Program 2021 Tree Contractor Recommendation:

Two bids were received for the City Tree Maintenance Program 2021.

Plant Growth Management Systems respectfully recommends that the City of Sturgis award the City Tree Maintenance Program 2021 contract to Asplundh Tree Experts LLC. This recommendation is based upon the following factors:

They have provided the lowest bid.
They have all the necessary human and equipment resources to meet the contract needs.
They have experience with city tree maintenance.

Attached are the three bids with the time and material rate schedules.

Sincerely,
Nate Kusmiz
Field Manager/City Forester
Plant Growth Management Systems
574-334-1363

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RIGHT OF WAY MANAGEMENT SERVICES 2021

THIS AGREEMENT made and entered into on the October 1st, 2021 by and between City of Sturgis with its principal place of business in Michigan (hereinafter called "Company"), and Plant Growth Management Systems, an S-Corporation, with its principal place of business in Niles, Michigan (hereinafter called "Contractor").

This agreement shall be evergreen, unless terminated by either party as provided herein. This agreement shall take effect on the day and year written above and shall continue and remain in force until the end of that year, and thereafter from year to year, until terminated by either party at least sixty (60) days written notice of its desire to terminate the agreement. Notwithstanding the foregoing, the Company may immediately terminate this agreement in the event the Contractor breaches any of the terms and conditions of the agreement.

Right-of-Way maintenance terms and limitations are described in **Section #1.** In order to provide tree growth regulator applications to the Company, parties to this agreement stipulate the following terms and limitations as listed in **Section #2**.

Section #1 Scope of Agreement

Category: **Forestry Field Manager**

Duties Include:

1. Planning necessary line clearance work. Necessary work is determined by the following field business criteria.
    a. Will the tree be in the conductor within the maintenance cycle?
    b. Is there a greater cost savings removing the tree rather than trimming?
    c. Is the tree a safety hazard?
    d. Is the tree within the "System Protection Zone" (will it affect the substation if the tree makes contact with the primary line)?
    e. If the tree cannot or should not be removed and cannot be trimmed to obtain adequate clearance, should the tree be treated with a growth regulator? (Each decision is dictated by the management goals of the customer and the budget available during the maintenance cycle.)
2. Making any and all customer contacts regarding removal of trees and brush
3. Auditing completed work and authorizing payment of work
4. Prepare and submit reports as needed to customer relating the budget and progress of the maintenance program
5. Investigate customer concerns as needed

Hourly fee of $60.80 includes trained Forestry Manager, cell phone, gas expense, and vehicle.

Category: **Operations Manager**

Duties include:

1. All of the above duties of Field Manager as needed
2. Management and coordination of Field Managers - *Supervisory duties are typically non-billable*

Hourly fee of $60.80 includes cell phone, gas expense, and vehicle.

Category: **Program Development/Consulting**

1. Program Development and Professional Consulting that falls outside of the scope of the contract will be billed at an hourly fee of $126.00.
2. Duties include:
    - Development of right-of-way management plan
    - Contract development

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Category: **Per-diem Charge when Applicable**

1. There will be a per-diem expense to cover travel costs for forestry field manager(s) that are assisting the utility's assigned managing field forester. The cost equates to an additional $15.00/hour per person for hours worked at the utility. PGMS reserves the right to reduce or waive the per-diem costs at its discretion.

Category: **Additional Charges when Applicable**

1. Additional charges for items related to facilitating the line clearance program such as tree marking paint, map copies, etc.

Category: **Storm Damage/Emergency Response Expectations**

1. The management work needed for Storm Damage/Emergency Response that falls outside of the scope of this contract will be billed separately at a regular hourly rate except for hours completed outside of normal working time (i.e.: night & weekends) or additional hours that exceed 40 hours per person per week, which will be billed at time and a half. In regards to the utilizing & reimbursing a Tree Subcontractor(s) for work completed on Storm Damage/Emergency Response work, it will be between the Company and Subcontractor(s).

Section #2 Scope of Agreement

Category: **Tree Growth Regulator Application**

1. The regulation product used will be ShortStop TGR. All applications shall be completed via soil application.

2. Contractor shall provide the following "post application" information to City of Sturgis.
    a) Date of application
    b) Amount of product applied
    c) Expected date of re-application

3. Contractor shall be responsible for tagging the regulated trees with
    a) Date of application
    b) Applicators initials
    c) Company name

4. Contractor shall be responsible for supplying customer contact information regarding questions about ShortStop TGR.

5. Contractor shall inspect all regulated trees before re-application to insure that re-application is needed.

6. The contractor shall address resolution of property owner complaints, concerns or questions within 48 hours of a working week.

7. All applications shall be completed using ShortStop TGR in a soil applied form.

8. Contractor shall adhere to all state and federal laws regarding pesticide application.

9. The contract price will be $74.50 per tree on a production-based system (normal routine maintenance no less than 20 trees to apply within the maintenance cycle). When a tree requires a chemical volume of 5000 mLs or more for an application, the $74.50 per tree will not be used, instead a flat fee of $.015 per mLs will be applied to the cost.

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10. In the event that the number of trees falls below 20, special rates may apply with the consent of both parties. Upon expiration of the current contract date the contract may be renewed with the consent of both parties.

Insurance Requirements

1. The Contractor shall take out and maintain throughout the contract period insurance with the following minimum requirements:

   a) Worker's compensation insurance covering all its workers, in statutory limits, who perform any of the obligations assumed by the Contractor under this agreement.

   b) Public liability and property damage liability insurance covering all operations under this agreement; limits for bodily injury or death not less than $1,000,000 for one person and $1,000,000 for each accident; limits for property damage not less than $1,000,000 for each occurrence and $1,000,000 annual aggregate. The insurance required by this subparagraph shall name Company as additionally insured to the extent of any claim, demand or suit made upon or against Company arising out of any such occurrence.

   c) Contractor agrees to hold City of Sturgis harmless from any liability, which may arise as a result of the performance of its Forestry Field Manager's & Operations Manager's duties and/or its application of plant growth regulators.

   d) Automobile liability insurance on all self propelled vehicles used in connection with the Contract, whether owned, non-owned, or hired; public liability limits of not less than $1,000,000 for one person and $1,000,000 for each accident; property damage limit of $1,000,000 for each accident.

   e) The Company shall have the right at any time to require insurance coverage greater than those required above. In such event, the additional premium or premiums solely as a result of such additional insurance shall be added to the Contract price.

   f) The Company requires that the policy include City of Sturgis as "additionally insured"

   g) All insurance policies required under this paragraph shall contain the appropriate endorsement, and cancellation and change language substantially equivalent to the following:

      "This insurance will not be canceled by this insurance company nor any changes made in the policy which change, restrict, or reduce the insurance provided, or change the name of the insured, without first giving thirty (30) days notice in writing to City of Sturgis, Attn: John Griffith, 130 N. Nottawa Str., Sturgis, MI 49091 as evidenced by return receipt of registered or certified mail."

   h) The Contractor shall provide a certificate of liability insurance to the Company on an annual basis.

In Regards to Recruiting Contractors Employees

1. During the term(s) of this Agreement and/or for twelve months following its termination, the Company may not directly or indirectly retain the services of or hire any of the Contractor's current or previous employee(s)for activities similar to that of the Agreement's contracted services. This clause is established for the purpose of compensating the Contractor for expenses related to recruiting, hiring and training employees for services to the Company and other loss revenue due to the employee recruitment.

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2. If it is the Company's desire to utilize the Contractor's current or previous employee(s) within this period of time, the Company will reimburse the Contractor as described in the following schedule;

   a) Within the first three years of said employee working with the Company on behalf of the Contractor, a conversion fee of 15% for the most recent, averaged 12 months of invoiced costs will be charged to the Company.

   b) After a minimum of three years of said employee working with the Company on behalf of the Contractor, the conversion fee of 15% for the most recent, averaged 6 months of invoiced costs will be charged to the Company.

Contractual Rights

1. It is expressly understood and agreed between the parties hereto that this agreement is not exclusive and that the Company may in its sole discretion contract with other persons or corporations to perform similar services for it and/or perform such work itself.

2. In the event the Contractor shall violate any of the provisions of this agreement, the Company shall have the immediate right to cancel this agreement and to complete the work undertaken by the Contractor without incurring any liability to the Contractor, other than payment to the Contractor of the fair value to the Company of the work already performed prior to such cancellation.

3. Subject to the restrictions hereinabove contained in regard to subcontracting, this agreement shall be binding upon the successors and assigns of the parties hereto. This agreement shall become effective upon execution and shall continue until the work contemplated hereby has been completed to the reasonable satisfaction of the Company or until otherwise terminated in accordance with other provisions of this agreement, whichever first occurs. In the event either party becomes insolvent, a petition in bankruptcy is filed for or against either party, or either party is placed under state court receivership, then the other party, at its option, may forthwith elect to terminate this agreement without further liability to the other.

4. It is the intention of the parties that Contractor shall at all times and in all respects be deemed an independent, outside contractor in the performance of its duties and responsibilities hereunder. It shall have no authority to act for or bind the Company, except that which is expressly granted by the nature of the work. This Contract shall be interpreted in all respects to be consistent with such independent contractual relationship.

5. Contractor represents and warrants to Company that it is duly authorized to do business within the State of Michigan as of the date of execution hereof. Contractor covenants and agrees to maintain such status during the life of this Contract and that the individuals executing this agreement on behalf of Contractor are duly authorized so to act and bind Contractor. Company makes the same representations to Contractor.

6. This contract is not in any way intended to be a guarantee of work or revenues, and is subject to business constraints of the Company.

7. The contractor hereby covenants on behalf of itself and its subcontractors not to discriminate against an employee or applicant for employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height, or marital status. Breech of this covenant may be regarded as a material breach of the contract.

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IN WITNESS WHEREOF the parties have executed this agreement and any approved Addenda hereto in counterpart original as of the day and year above first written.

"COMPANY – City of Sturgis"

BY: _____

ITS: _____

Signature: _____

DATE: _____

"CONTRACTOR – Plant Growth Management Systems"

BY: Laurie Mann
CFO/Owner

Signature: _____

DATE: _____

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Right-of-way line clearance Contract

2020-2021

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The City of Sturgis
RIGHT-OF-WAY CLEARANCE CONTRACT

This Contract made and effective this 1st day of October, 2020, by and between The City of Sturgis, with its principal place of business at 130 N. Nottawa St., Sturgis, MI 49091 hereinafter called the COMPANY and Treecore LLC, with its principal place of business at PO Box 353, 7195 Youngren Rd., Harbert MI 49115, hereinafter called the "Contractor."

The term of this Contract shall be to September 30, 2021 and may be renewed thereafter in writing for an additional one year period. The Company reserves the right to terminate this Contract by the terms outlined in ARTICLE V Section B.

ARTICLE I

PURPOSE AND GENERAL

A. The Company is a municipal electric utility who will employ the Contractor to perform line clearance, tree trimming, brush and tree removal and vegetation control along the Company's designated electric lines, green spaces and street right-of-way in accordance with specifications set forth in Addendum A. and for the compensation set forth on the attached Addendum B. In performing its responsibilities under this Contract, the Contractor shall be and shall function as an independent, outside contractor and neither it, its employees, nor its subcontractors (if any) shall be deemed to be employees or agents of the Company.

B. The Contractor shall do the work called for by this contract using to its own labor, equipment, means and methods, which shall belong to and remain in the exclusive charge and control of the Contractor, and which shall not be subject to any control or supervision by the Company, except as to the results of said work; and it is expressly understood that the Company does not hereby hire or rent the use of the same, or assume any liability for the use or method of use thereof.

C. The Contractor and its employees and subcontractors, if any, will at all times be responsible for conducting itself in a courteous and non-confrontational manner with property owners, customer-citizens of the Company, and public authorities in order not to jeopardize relationships between the Company and its customer-citizens or the general public.

D. The Contractor shall be responsible for developing and implementing proper and effective safety techniques and training in regards to its employees for the purpose of minimizing the possibility of accidents, injuries, or damage to persons or property in connection with the work intended hereby.

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E. The Contractor shall comply with all ordinances, laws, orders, rules and regulations pertaining to such work made by any governmental authority or public regulatory body and, except as otherwise provided in Article IV hereof, shall secure all licenses or permits required by law. The Contractor shall also furnish to the Company, when requested, a certificate or other proof of said compliance. The Contractor shall comply with all applicable OSHA and state appropriate safety standards. The Contractor shall, when requested by the Company, forward documentation of crew training prior to the start of the project.

F. In order to ensure satisfactory relationships between the Company and its customer- citizens and landowners abutting Company easements, the Contractor shall clean up its work areas at the end of each day and remove and dispose of the vegetation and debris resulting from its work, subject to the specifications attached hereto as Addendum A which shall be controlling.

G. The terms of this contract shall not be changed, superseded or supplemented except in writing signed by the parties hereto. This contract shall not be assigned or any part thereof sublet by the Contractor without the Company's written consent.

H. The Contractor and its employees agree to perform their duties in accordance with the Company's values statement, if any, which if applicable, shall be provided to the Contractor.

I. In the event of an emergency caused by storms or for any other reason the Contractor shall respond and perform its services commencing within two (2) hours after notification by the Company.

J. In the event of non-emergency work that must be performed outside of the normal unit work, the Contractor shall provide the requested equipment.

K. The Contractor shall hire the necessary personnel to complete all work planned in the calendar year. The Contractor shall complete the scheduled annual production unit work on a quarterly basis. Any deviations from this expectation must be approved in writing by the Company or PGMS representative. If the Contractor wishes to complete the bulk of the work in a shorter amount of time it must make available, upon request, a minimum of one crew through the remainder of the contract period. In order to complete the bulk of the work in a shorter amount of time the Contractor shall submit a written proposal to the Company. The Company reserves the right to reject any proposals not consistent with the attached addenda.

ARTICLE II

PAYMENT

A. The Company agrees to pay and the Contractor agrees to accept in full compensation for the work to be performed by the Contractor, the amounts of the fixed price set forth in Addendum B hereto annexed.

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B. In the event that the work calls for a variable or indeterminate Contract price dependent upon time charges of the Contractor devoted to the work, the time of the Contractor's employees will start when they reach the established meeting place to be mutually agreed upon by the Contractor and the Company, and will cease when they return to the established meeting place, with the usual time off for the noon day meal. An ordinary workweek shall consist of forty (40) hours at straight-time rates. Overtime work which results in an additional charge may be performed hereunder provided the same shall have been authorized by the Company in writing prior to the performance thereof.

C. The Contractor agrees to render to the Company weekly invoices and daily work reports for the invoice period for each work crew, detailing trees trimmed, or trees removed for all work performed the preceding week. In the case of a fixed price Contract, these invoices shall be for the Company's informational purposes in monitoring the progress of the job. In the case of variable or indeterminate price Contract, the Company agrees to pay such invoices within thirty (30) days of approval of the week covered by such statement. The provisions of the following paragraph D shall apply to all Contracts.

D. The Company may withhold payments for work completed to the extent necessary to protect itself against loss on account of:

1. Defective work that is not remedied in an appropriate amount of time.
2. Claims filed or reasonable evidence indicating probable filing of claims.
3. Failure of the Contractor to make payments promptly to its subcontractors, or for material or labor.
4. Damages to structures or properties.

When the Contractor has corrected the above conditions, the Company agrees to pay any amounts withheld because of those conditions within thirty (30) days of approval.

E. All work submitted by Contractor for payment will be inspected by an employee of the Company or its representative to ensure the work is properly completed. Any crew and equipment time necessary to correct work invoiced and not accepted may not be billed to Company as a result of correction.

F. It is the Contractor's responsibility to preview the issued production unit work. Prior to commencing work, all time and material requests must be preapproved by the Company or a PGMS representative. Failure to notify the Company or PGMS representative prior to commencement of production line clearance work may result in the denial of time and material charges, and payment will be made based on the contractual unit price listed in the line clearance rate schedule.

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ARTICLE III

INSURANCE / LIABILITY REQUIREMENTS

A. The Contractor agrees to be responsible for, and to protect, indemnify and hold harmless the Company from and against the payment of any and all sums of money, by reason of any accidents, injuries, or damages to persons or property, which may arise out of or in connection with the Contractor's performance or non-performance of the Contract work, including reimbursement of Company's reasonable attorney fees and costs incurred in the investigation, defense, or resolution of any such claim.

B. Neither the Company nor the Contractor shall be liable either to the other, for loss, damage, or delay resulting from causes beyond its reasonable control such as those caused by fire, flood, accident, labor controversy, civil, governmental or military authority, insurrections, riot, embargoes, unavoidable delays in transportation, acts of God or the public enemy, or inability or delays in procuring materials.

C. The Contractor shall obtain and maintain throughout the Contract term insurance coverage in the following minimum requirements:

1. Worker's compensation insurance, in statutory limits, covering all its workers who perform any of the obligations assumed by the Contractor under this Contract.
2. Public liability and property damage insurance covering all operations under this Contract with limits for bodily injury or death or property damage in an amount not less than $1,000,000 per occurrence. The insurance required by this subparagraph shall name Company as a coinsured to the extent of any claim, demand or suit made upon or against Company arising out of any such occurrence.
3. Automobile liability insurance on all self-propelled vehicles used in connection with the Contract, whether owned, non-owned, or hired with liability limits for bodily injury or death or property damage in an amount not less than $1,000,000 per occurrence.
4. The Company shall have the right at any time to require insurance coverage greater than those required above. In such event, any additional premium applicable to such additional insurance shall be added to the Contract price.
5. The Company shall require the same insurance provisions will be adhered to for all subcontracted or for-hire entities that the Contractor may choose to use for Contract purposes.
6. The Company requires that the policy include as "additionally insured" the Company's proper name and assumes all officers, agents, and employees thereof and those governmental bodies performing permit activities for the Company pursuant to a maintenance Contract.
7. All insurance policies required under this paragraph C of Article III shall contain the appropriate endorsement, and cancellation and change language substantially equivalent to the following:

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This insurance will not be cancelled by this insurance company nor any changes made in the policy which change, restrict, or reduce the insurance provided, or change the name of the insured, without first giving thirty (30) days' notice in writing to the Company using the following address; City of Sturgis, 130 N. Nottawa St., Sturgis, MI 49091, Attn: Operations Manager, as evidenced by the return receipt of registered or certified mail.

ARTICLE IV

PERMITS

The Contractor agrees to notify municipal, state or federal authorities, where such authorities have jurisdiction prior to entering their lands. The obtaining of all original consents, easements, or permits for such line clearing, trimming, or vegetation control being the responsibility of the Company.

ARTICLE V

CONTRACTUAL RIGHTS

A. It is expressly understood and agreed upon by both the parties hereto that the right to perform tree-trimming and line clearance work for the Company is not being granted exclusively to Contractor and that the Company may in its sole discretion contract with other persons or corporations to perform similar services for it and/or perform such work itself.

B. In the event that the Company wants to terminate the contract either because of a violation by the Contractor of any provisions of this Contract, or for any other reason, the Company shall have the immediate right to cancel this Contract upon advance written notice to Contractor and to complete the work commenced by the Contractor without incurring any liability to the Contractor, other than payment to the Contractor of the fair value to the Company of the work already performed prior to such cancellation.

C. Subject to the restrictions hereinabove contained in regards to subcontracting, this Contract shall be binding upon the successors and assigns of the parties hereto. This Contract shall become effective upon execution and shall continue until the work agreed upon has been completed to the reasonable satisfaction of the Company or until otherwise terminated in accordance with other provisions of this Contract, whichever comes first. In the event that either of the parties becomes insolvent, a petition in bankruptcy is filed for or against either party, or either party is placed under state court receivership, then the other party, at its option, may forthwith elect to terminate this Contract without further liability to the other.

D. It is the intention of the parties that the Contractor shall at all times and in all respects be deemed an independent, outside contractor in the performance of its duties and responsibilities hereunder. It shall have no authority to act for or bind the Company. This Contract shall be interpreted in all respects to be consistent with such independent contractual relationship.

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E. The Contractor represents and warrants to the Company that, as a corporation or similar entity, it is duly incorporated or similarly integrated and in good standing with the State of Michigan and duly authorized to do business within the State of Michigan as of the date of execution hereof. The Contractor covenants and agrees to maintain such status during the life of this Contract and that the individuals executing this Contract on behalf of the Contractor are duly authorized to act and bind the Contractor. The Company makes the same representations to the Contractor.

IN WITNESS WHEREOF the parties have executed this Contract as of the day and year above first written.

"COMPANY – The City of Sturgis"

BY: _____, ITS: _____

Signature: _____

DATE: _____

"CONTRACTOR"

BY: _____, ITS: _____

Signature: _____

DATE: _____

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Addendum A

Line Clearance Management Specifications

Prepared by:

P.O. Box 214, Niles, MI 49120
Phone: (269) 663-7467 Toll Free: 1-877-902-7467
Email: info@pgmstgr.com

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Preface:

The extent of the following specifications is to provide guidelines and expectations for line clearance and terrace right of way trimming, removal of trees, brush, and other vegetation. The specifications will include the performance of new right-of-way clearing work for electric service extensions. Any deviations from these specifications must be approved in writing by a PGMS Field Manager or a representative the COMPANY.

Definitions and Related Terms:

- A TREE is a stem(s) of a woody plant that has a 4 inch dbh or larger (this includes "stump sprout trees").
- BRUSH is any plant that has less than 4 inch dbh.
- A UNIT of brush is defined as 500 square feet measured from canopy edge to canopy edge and can be broken down to the nearest $1/10^{th}$ unit.
- A TRIM is any woody plant that is identified to be trimmed.
- A REMOVAL is any plant that has a 4 inch dbh or larger and has been identified to be removed.
- The entity responsible for the line clearance trimming is the CONTRACTOR and the entity requesting the work to be done is the COMPANY.
- AUTHORIZED WORK is any and all work that is issued to the CONTRACTOR by a PGMS Field Manager or a representative of the COMPANY. Only work planned will be considered authorized work.
- COMPLETED WORK is authorized work completed in accordance with these line clearance management specifications.

Preplanning of Work:

- A qualified PGMS Field Manager will complete all line clearance preplanning in conjunction with and/or in advance of authorized work.
- Either a PGMS Field Manager or a representative the COMPANY must approve any changes made to the authorized work.
- Either a PGMS Field Manager or a representative the COMPANY must approve any and all time and material work prior to said work being initiated.
- A PGMS Field Manager will inspect the completed work and present a written recommendation for payment to the COMPANY upon acceptance of said work.

Contractor Obligations:

- Before submitting work to the PGMS Field Manager for a payment recommendation a representative of the CONTRACTOR must inspect all work prior to considering it completed.
- For a PGMS Field Manager to present a written recommendation to the COMPANY for payment, the work completed must be a minimum of 95% correct. The work is considered correct if it corresponds with this guideline's specifications. Any amount retained for uncompleted work will be paid upon final completion and acceptance of the work by the COMPANY.

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- If the work is less than the stated percentage, the line clearance CONTRACTOR is responsible for the cost of re-inspection by a PGMS Field Manager at an hourly rate of $75.00.
- The work location of the CONTRACTOR shall be reported daily to a representative of the COMPANY or a PGMS Field Manager. In addition, the CONTRACTOR shall provide weekly time sheets describing the nature of work performed and the amount of man-hours spent on said work.
- The CONTRACTOR will contact a PGMS Field Manager, a representative of the COMPANY and the property owner within a reasonable amount of time when a damage complaint has been received.
- The progress or resolution of a damage complaint should be reported to the PGMS Field Manager, a representative of the COMPANY and the property owner as soon as possible.
- In the event a dispute arises between the property owner and the CONTRACTOR, the COMPANY has the final authority as to the responsibility and liability of the CONTRACTOR.
- The CONTRACTOR shall be responsible for the cost of all herbicide.
- Any herbicide applications (except stump treatments) must be approved in advance by a manager of PGMS.

Field Specifications for Electric Utility Trimming:

- All trees shall be trimmed according to arborist standards as described in the most up-to-date ANSI A300 Guidelines.
- All trees shall be trimmed for the maximum clearance allowed while using the ANSI A300 standards and/or while completing line clearance to a minimum of three (3) years clearance. Where a three (3) year minimum clearance is not physically possible or other deviations are necessary, the CONTRACTOR will contact a PGMS Field Manager for authorization.
- All dead, dying, or defective limbs of authorized work, which may interfere with or endanger operational safety and line maintenance, shall be removed even if they may be outside the clearance specified.
- All limbs and brush resulting from authorized work shall not be left on the property overnight unless the landowner is notified.
- All wood larger than 3 inches in diameter from a trimmed or removed tree shall be cut into reasonable lengths for the property owner to handle easily and neatly stacked at the base of the tree or adjacent to the stump.
- All wood less than 3 inches in diameter from a trimmed or removed tree shall not be left on the property.
- All wood and brush debris resulting from authorized work shall not be left within public, road, or utility right-of-way, and must be moved to an area that will not interfere with utility access or flow of streams and irrigation ditches.
- Permission from the property owner must be obtained prior to windrowing or stacking of brush and it remains the responsibility of the CONTRACTOR if the property owner rescinds the offer for any reason. If brush is windrowed, useable wood must be separated from the brush, and the windrow must be placed in such a way that it will not limit normal access to right-of-way and include “gaps” at each pole structure.

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- All stumps shall be cut at a height no greater than 3 inches above ground.
- All stumps shall be treated with an approved herbicide unless off-site contact is possible or if the tree is unaffected by the herbicide (i.e.: most evergreens).
- All brush stumps shall be flush cut, resulting in no "spears" left in the right-of-way.
- The CONTRACTOR may, at its own discretion, use any herbicide necessary for each situation as long as the contractor holds all required permits and licenses for such application and the herbicide meets governmental requirements and attains the minimum 90% kill rate. If the kill rate is below 90%, the CONTRACTOR is responsible for retreating at its expense.

Line Clearance Trimming Requisites:

- All work issued shall be completed on the fixed price (unit) outlined in Article II of the right-of-way clearance contract. It is expected that each job issued will be inspected by the CONTRACTOR and any variable (time and material) requests will be made in advance of commencing work.
- Three phase and multi-phase lines shall be trimmed to eliminate any overhang while maintaining the health of the tree. When overhang branches are left on tree, they should appear to be structurally able to withstand the normal stress of wind, snow, and ice.
- Overhang on single-phase lines shall be trimmed to obtain a minimum of 15 feet of clearance and any overhang branches that are left on the tree should be able to withstand the normal stress of wind, snow, and ice.
- Secondary and service lines shall be trimmed to provide swing clearance and in accordance to arborist standards.

Field Specifications for Mechanical Clearing:

- All rights-of-way shall be cleared back to the original boundary line. If the boundary is not evident all rights-of-way shall be designated as 30 feet in width (15 feet on either side of the utility center line). Deviations from this must be approved by a PGMS Field Manager or a representative of the COMPANY.
- All non-utility compatible vegetation shall be removed from right-of-way.
- All utility compatible brush can be left as long as it does not interfere with normal COMPANY operations.
- All stumps shall be cut at a height no greater than 3 inches above ground. All brush stumps shall be flush cut, resulting in no "spears" left in the right-of-way.

Field Specifications for Foliar and Basal Herbicide Application:

- All herbicide work shall be completed utilizing either a foliar or a basal application.
- All herbicide work shall be completed utilizing a low volume application (50 gallons per acre or less) and in some cases when the areas require an increased amount of product, modified low volume (75 gallons per acre or less).
- The CONTRACTOR may, at its own discretion, use any herbicide necessary for each situation as long as the herbicide meets governmental requirements and attains a minimum of 95% kill rate. If the kill rate is below 95%, the CONTRACTOR is responsible for retreating at its own expense.

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- Whenever possible all utility compatible brush species shall not be treated unless specified by the COMPANY or when said brush is growing in a manner as to limit the COMPANY'S normal operations.
- The CONTRACTOR shall be responsible for the cost of all herbicide billable to the COMPANY through its rates in Addendum B.
- The CONTRACTOR shall be responsible for the results of any off site vegetation kill.

Field Specifications for Bare Ground herbicide application:

- For best results applications should occur within the months of March and April, timing will be dependent on weather conditions.
- The CONTRACTOR may, at its own discretion, use any herbicide necessary for each situation as long as the herbicide meets governmental requirements and attains a minimum of a 100% kill rate inside the fenced area of the substations and a 95% kill rate on the remaining area of control. If the kill rate is below these percent minimums, the CONTRACTOR shall be responsible for retreating at its own expense.
- On steep or hard packed gravel drives; bare ground applications shall not be used in order to prevent off site run off. In these situations an herbicide mix such as glyphosate and 2, 4-D will be needed. Any herbicide used shall be approved in advance by the COMPANY or a PGMS Field Manager. Multiple applications may be needed in these situations to control re-growth all season long.
- Escapes/re-growth inside the substation after bare ground application must be re-treated by the CONTRACTOR. This does not apply to the gravel area outside of the substation fenced area or gravel drives around the substation.
- The CONTRACTOR shall be responsible for the cost of all herbicide billable to the COMPANY through its rates in Addendum B. (The cost of herbicide for stump cut herbicide remains the responsibility of the CONTRACTOR.)
- The Contractor shall be responsible for the results of any off site vegetation kill.

Field Specifications for Terrace, Park and Cemetery work:

- All work shall be completed according to arborist standards as described in the most up-to-date ANSI A300 Guidelines. Exceptions must be approved in writing by a PGMS field Manager or a representative the COMPANY.
- All Terrace, Park and Cemetery trees will be trimmed for both city and privately owned property as outlined in the most up to date city ordinances.
- All debris shall be removed as outlined in the field specifications with the exception of wood over 3 inches in diameter; this shall be removed within 72 hours.
- All stumps shall be removed to a minimum depth of 6 to 8 inches or to a depth equal to the surrounding landscape.
- All woody debris from stump grinding shall be removed.
- All stumps shall be filled with a viable quality top soil, tamped down, and seeded with a grass mixture to be approved by the PGMS field Manager or a representative of the COMPANY.

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Field Specifications: Newly Planted Trees

- All trees shall be planted in accordance with the most up to date ANSI A300 (Part 6) Planting and Transplanting standards including Annex A through D.
- Trees must have a single, relatively straight trunk and central leader. They must be free of codominant stems and vigorous upright branches that compete with the central leader. If the original leader has been headed a new leader at least one half of the diameter of the original leader must be present.
- The tree trunk must be relatively straight, vertical and free of wounds.
- The contractor shall be responsible for all certificates of inspection of plant materials that are required by Federal, State or other authorities to accompany shipments of plants, and these shall be filed with the PGMS Field Manager prior to acceptance of the material.
- All new trees must be inspected and approved before they are planted by the PGMS Field Manager. The ANSI A300 Part 6 standard (Annex B) "Tree structure assessment checklist" will be used for the inspection.
- All planting shall be completed by **_____.** Prior to delivery and planting the contractor shall give the company two weeks' notice.
- All debris and excess soil resulting from the tree being planted must be removed from the site, if required; the City of Sturgis will provide a place to dispose of debris.
- Any damage to the site or project incurred during the planting operations, including any removal and/or replacement of architectural materials site improvements, or utilities shall be the financial responsibility of the planting contractor. The contractor shall make replacement immediately and at no additional cost to the City.
- Trees shall be guaranteed for the duration of two full growing seasons after acceptance and shall be alive and in satisfactory growth at the end of the guarantee period. The growing season is defined as beginning April 15 and ending October 15.
- At the end of the guarantee period and upon written request from the contractor, the PGMS Field Manager will make final inspection. The contractor shall remove and replace promptly any plant material required under this specification that is dead or not showing satisfactory growth as determined by the PGMS Field Representative. The replacement shall be of the same variety, size, and character as specified for original planting. The replacement tree shall have the same guarantee and length of guarantee period as is specified above.

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Line clearance unit and time and material rate schedule 2020/2021

Contractor: Treecore, LLC Date: 10/1/2020

Fee Schedule Line Clearance

Unit Prices

Trim a tree	$ 80.00
Remove a tree	$ 79.00
Remove one unit of brush 500 sq. ft.	$ 79.00

Time and Material Hourly Rates

	Hourly Rates
Emergency Call-out	
Two-person crew with bucket truck excluding chipper	$ 183.00
Three-person crew with bucket truck excluding chipper	$ 240.00
Regular time	
Two-person crew with bucket truck and chipper	$ 127.00
Three-person crew with bucket truck and chipper	$ 185.00
Four-person crew with bucket truck and chipper	$ 250.00
Two-person manual crew with chipper	$ 127.00
Three-person manual crew with chipper	$ 185.00
Four-person manual crew with chipper	$ 250.00
Foreman	$ 65.00
Trimmer	$ 65.00
Ground man / Flagger	$ 60.00
Bucket truck	$ 25.00
Chipper Truck	$ 25.00

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Chipper	$ 20.00
Pickup	$ 10.00
Dump Truck	$ 25.00
Loader/Tractor	$ 75.00
Loader/Tractor and Dump Truck (fully staffed and equipped)	$ 220.00
Mowing Machine **(Fully equipped)** Specify type : ASV& FAE	$ 178.00
Stump Grinding Specify if by: per stump or per stump diameter inch : per stump diameter inch	$ 18.00

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City Tree Maintenance time and material rate schedule 2021

Contractor Asplundh Tree Experts LLC. Date 9-11-20

City Tree Maintenance Fee Schedule

Time and Material Hourly Rates	Hourly Rates
Emergency Call-out	
Two-person crew with bucket truck excluding chipper	$ 165.60
Three-person crew with bucket truck excluding chipper	$ 224.11
Regular time	
Two-person crew with bucket truck and chipper	$ 126.5
Three-person crew with bucket truck and chipper	$ 171.6
Four-person crew with bucket truck and chipper	$ 214.54
Two-person manual crew with chipper	$ 121.66
Three-person manual crew with chipper	$ 165.17
Four-person manual crew with chipper	$ 210.14
Loader/Tractor and Dump Truck (fully staffed and equipped)	$ 134.31
Foreman	$ 56.60
Trimmer	$ 45.71
Ground man / Flagger	$ 43.60
Bucket truck	$ 18.9
Chipper Truck	$ 14.75
Dump Truck	$ 14.75
Chipper	$ 5.00
Pickup	$ 11.55

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Loader/Tractor $ 35.20

Stump Grinding:

- Specify if by: per stump or per stump diameter inch.
- Stump grinding rate will include time and material, removal of stump grindings, top soil, and grass seed.

: PER STUMP DIAMETER INCH $ 15.50

Anti-Collusion Statement

The Contractor certifies that this proposal is fair, genuine and not collusive or a sham, and has not in any manner, directly or indirectly, agreed or colluded with any person, firm or association to submit a sham proposal, to refrain from submitting a Bid or in any way fix the amount of this proposal or to secure any advantage against The City of Sturgis.

This Bid is submitted in the name of: Asplundh Tree
Company

2810 West Grand River	Howell	Michigan	48843
Street	City	State	Zip code

For the stated conditions and price(s), the undersigned submits this proposal:

Signed 11th day of September , 2020

BY (name) Kris Keefer

Its (Title) Region Manager

Phone Number 330-696-2759

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City Tree Maintenance time and material rate schedule 2021

Contractor Midwest Tree Service **Date** 9-14-20

City Tree Maintenance Fee Schedule

Time and Material Hourly Rates	Hourly Rates
Emergency Call-out	
Two-person crew with bucket truck excluding chipper	$ 250.00
Three-person crew with bucket truck excluding chipper	$ 375.00
Regular time	
Two-person crew with bucket truck and chipper	$ 185.00
Three-person crew with bucket truck and chipper	$ 270.00
Four-person crew with bucket truck and chipper	$ 370.00
Two-person manual crew with chipper	$ 175.00
Three-person manual crew with chipper	$ 250.00
Four-person manual crew with chipper	$ 325.00
Loader/Tractor and Dump Truck (fully staffed and equipped)	$ 250.00
Foreman	$ 105.00
Trimmer	$ 125.00
Ground man / Flagger	$ 95.00
Bucket truck	$ 165.00
Chipper Truck	$ 125.00
Dump Truck	$ 125.00
Chipper	$ 125.00
Pickup	$ 125.00

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Loader/Tractor $ 125.00

Stump Grinding:

- Specify if by: per stump or per stump diameter inch.
- Stump grinding rate will include time and material, removal of stump grindings, top soil, and grass seed.

: Per inch $ 10.00

Anti-Collusion Statement

The Contractor certifies that this proposal is fair, genuine and not collusive or a sham, and has not in any manner, directly or indirectly, agreed or colluded with any person, firm or association to submit a sham proposal, to refrain from submitting a Bid or in any way fix the amount of this proposal or to secure any advantage against The City of Sturgis.

This Bid is submitted in the name of: Midwest Tree Service
Company

P.O. Box 60 Belmont MI 49306
Street City State Zip code

For the stated conditions and price(s), the undersigned submits this proposal:

Signed 14 day of Sep, 2020

BY (name) _____

Its (Title) Owner

Phone Number 517-394-2328

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 10D

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Mead & Hunt

May 19, 2020

Ms. Amanda Hopper
MDOT Office of Aeronautics
2700 Port Lansing Road
Lansing, MI 48906

Subject: Kirsch Municipal Airport
Sturgis, Michigan
Federal Project No. X-26-0092-2020
Rehabilitate Runway 1-19

Dear Ms. Hopper:

Attached is the Bid Tab Summary, Recommendation to Award, and Bids pertaining to the subject project. By copy of this letter, we are also notifying Allen J. Lindstrom and Mr. Andrew Kuk of this recommendation.

Please let me know if you require any further information in this regard.

Sincerely,

MEAD & HUNT, Inc.

Sean Thompson

Sean Thompson, PE
Project Manager

Enclosures

cc: Mr. Allen J. Lindstrom, Michigan Paving and Materials, Recommendation to Award, Bid Tab Summary
Mr. Andrew Kuk, Kirsch Municipal Airport, Recommendation to Award, Bid Tab Summary and Bids

RECOMMENDATION TO AWARD
Kirsch Municipal Airport
Andrew Kuk, Airport Manager 130
North Nottawa Street Sturgis, MI
49091
Prepared by Mead & Hunt, Inc.

Project Description: Rehabilitate Runway 1-19

Consultant:
Mead & Hunt, Inc.
2605 Port Lansing Road
Lansing, MI 48906
517-321-8334

Bid Opening:
May 15, 2020
2:00 pm, local time
Opening via Microsoft Teams Meeting conducted from
Mead & Hunt Office
2605 Port Lansing Road
Lansing, MI 48906

Engineer's Estimate: $3,582,595.75

Bids Received: Bids for the subject project were opened and read publicly at the date, time and location noted above by Mead & Hunt, Inc. Bids were received for the project as follows:

AS CHECKED BIDS:

Contractor	Bid Amount
Michigan Paving and Materials	$3,540,505.85

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The lowest apparent bidder, as based on the Base Bid amount, was Michigan Paving and Materials (MPM). Upon review of the bid documentation it was noted that MPM offered a Disadvantaged Business Enterprise (DBE) percentage of 0.42%. MDOT Office of Aeronautics had issued a DBE utilization goal of 4% for the project. MPM's Good Faith Effort (GFE) was provided with their bid and is under review with MDOT Office of Aeronautics.

The lowest responsive bidder, as based on the Base Bid amount, was Michigan Paving and Materials. The Base Bid amount is identified in the proposal as the basis of award. Since only one bid was received, notification to the ADO is required.

Funding is expected to be available; therefore, it is recommended a contract be awarded to Michigan Paving and Materials. The bids have been reviewed for bid improprieties according to the criteria in FAA Order 5100.38. Notification to the Office of the Inspector General is not expected to be required.

Recommendation to Award: It is recommended that a contract for Rehabilitate Runway 1-19 be awarded to:

Michigan Paving and Materials
2300 Glendenning Road
Kalamazoo, MI 49001

Sean Thompson, PE

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BID TABULATIONS

PROJECT:	Runway 1-19 Rehabilitation
LOCATION:	Kirsch Municipal Airport
CITY:	Sturgis, MI
DATE:	5/15/2020
REVISED:	
PREPARED BY:	SCT, AMH

Mead & Hunt

WORK DESCRIPTION:	Runway 1-19 Rehabilitation. Full depth reclamation, includes connectors to hold line and taxiway turn arounds on Runway 1 and 19 ends.

CAT 1 & CAT 2 - COMBINED

	ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	Engineer's Opinion of Probable Cost UNIT PRICE	Engineer's Opinion of Probable Cost ITEM COST	Michigan Paving and Materials 2300 Gelndenning Road Kalamazoo, MI 49001 369-343-4659 UNIT PRICE	Michigan Paving and Materials 2300 Gelndenning Road Kalamazoo, MI 49001 369-343-4659 ITEM COST
	100001	Contractor Quality Control Program (CQCP)	LS	1	$ 50,000.00	$50,000.00	$119,600.00	$119,600.00
	102001	Installation and Removal of Silt Fence	LFT	200	$ 3.00	$600.00	$3.70	$740.00
	105001	Mobilization	LS	1	$ 350,000.00	$350,000.00	$346,130.00	$346,130.00
	105002	Safety and Security	LS	1	$ 150,000.00	$150,000.00	$537,155.00	$537,155.00
	105003	Permits	DLR	5000	$ 1.00	$5,000.00	$1.00	$5,000.00
	105004	Remove Guidance Sign	EA	8	$ 500.00	$4,000.00	$525.00	$4,200.00
	108001	No. 8 AWG, 5KV, L-824, Type C, Cable, Installed in Trench, Duct Bank or Conduit	LFT	7500	$ 2.50	$18,750.00	$1.50	$11,250.00
	108002	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed in Trench, Including Connections/Terminations	LFT	7400	$ 2.00	$14,800.00	$2.50	$18,500.00
	108003	REIL Interconnect Cable, Installed in Trench, Duct Bank or C	LFT	400	$ 5.00	$2,000.00	$3.50	$1,400.00
	110001	Non-Encased Electrical Conduit, HDPE, 1 1/2"	LFT	7400	$ 4.50	$33,300.00	$7.25	$53,650.00
	110002	Non-Encased Electrical Conduit, PVC, 3"	LFT	400	$ 7.00	$2,800.00	$13.00	$5,200.00
	110003	Extend Non-Encased Electrical Conduit, 3"	LFT	50	$ 15.00	$750.00	$20.00	$1,000.00
	110004	Extend Non-Encased Electrical Conduit, 4"	LFT	25	$ 20.00	$500.00	$25.00	$625.00
	115001	Junction Can, Size D	EA	8	$ 500.00	$4,000.00	$1,500.00	$12,000.00
	125001	L-861, Salvaged and Reinstalled, Base Mounted	EA	33	$ 750.00	$24,750.00	$1,725.00	$56,925.00
	125002	L-858R(L), Size 1, Style 2, Class 1, Mode 2, Guidance Sign, Pad Mounted	EA	9	$ 2,500.00	$22,500.00	$5,300.00	$47,700.00
	152001	Unclassified Excavation	CYD	3534	$ 10.00	$35,340.00	$18.00	$63,612.00
	152002	Subgrade Undercutting	CYD	500	$ 30.00	$15,000.00	$26.00	$13,000.00
	154001	Subbase Course	CYD	2800	$ 25.00	$70,000.00	$31.00	$86,800.00
	207001	In-Place Full Depth Recycled (FDR) Asphalt Aggregate Base Course	SY	80047	$ 2.00	$160,094.00	$1.37	$109,664.39
	207002	Fine Grade and Compact Asphalt Aggregate Base Course	SY	75724	$ 1.00	$75,724.00	$2.02	$152,962.48
	207003	Asphalt Aggregate Base Course	CYD	910	$ 7.50	$6,825.00	$9.00	$8,190.00
	207004	Remove and Stockpile FDR Asphalt Aggregate Base Course	CYD	7000	$ 10.00	$70,000.00	$0.01	$70.00
	401001	Bituminous Surface Course, Gradation 2	TON	19974	$ 110.00	$2,197,140.00	$81.10	$1,619,891.40
	603001	Emulsified Asphalt Tack Coat	GAL	7712	$ 3.00	$23,136.00	$3.00	$23,136.00
	620001	Airfield Pavement Marking, Half-Rate, Yellow	SF	7890	$ 0.50	$3,945.00	$0.40	$3,156.00
	620002	Airfield Pavement Marking, Half-Rate, White	SF	37687	$ 0.50	$18,843.50	$0.40	$15,074.80
	620003	Airfield Pavement Marking, Full-Rate, Yellow	SF	15532	$ 0.75	$11,649.00	$0.59	$9,163.88
	620004	Airfield Pavement Marking, Full-Rate, White	SF	37687	$ 0.75	$28,265.25	$0.59	$22,235.33
	620005	Airfield Pavement Remarking, Full-Rate, Yellow	SF	1378	$ 1.00	$1,378.00	$0.59	$813.02
	621001	Sawcut Runway Grooves	SY	46053	$ 2.00	$92,106.00	$3.35	$154,277.55
	705001	6 Inch Underdrain	LFT	1400	$ 8.00	$11,200.00	$16.00	$22,400.00
	705002	6 Inch Underdrain Pipe End Section	EA	2	$ 100.00	$200.00	$224.00	$448.00
	901001	Seeding	AC	6	$ 2,500.00	$15,000.00	$1,420.00	$8,520.00
	905001	Topsoiling, Furnished from Off the Site	CYD	1600	$ 30.00	$48,000.00	$0.01	$16.00
	908001	Mulching	AC	6	$ 2,500.00	$15,000.00	$1,000.00	$6,000.00
					TOTAL =	$3,582,595.75	TOTAL =	$3,540,505.85
					Percent of Low Bid: 101.19% Percent of Estimate: 100.00%		Percent of Low Bid: 100.00% Percent of Estimate: 98.83%	

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BID TABULATIONS

PROJECT:	Runway 1-19 Rehabilitation
LOCATION:	Kirsch Municipal Airport
CITY:	Sturgis, MI
DATE:	5/15/2020
REVISED:	
PREPARED BY:	SCT, AMH

Mead & Hunt

WORK DESCRIPTION:	Runway 1-19 Rehabilitation. Full depth reclamation, includes connectors to hold line and taxiway turn arounds on Runway 1 and 19 ends.

CATEGORY ONE - FEDERAL DISCRETIONARY

	ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	Engineer's Opinion of Probable Cost UNIT PRICE	Engineer's Opinion of Probable Cost ITEM COST	Michigan Paving and Materials, 2300 Gelndenning Road, Kalamazoo, MI 49001, 369-343-4659 UNIT PRICE	Michigan Paving and Materials ITEM COST
	100001	Contractor Quality Control Program (CQCP)	LS	0.85	$ 50,000.00	$42,500.00	$119,600.00	$101,660.00
	102001	Installation and Removal of Silt Fence	LFT	200	$ 3.00	$600.00	$3.70	$740.00
	105001	Mobilization	LS	0.85	$ 350,000.00	$297,500.00	$346,130.00	$294,210.50
	105002	Safety and Security	LS	0.85	$ 150,000.00	$127,500.00	$537,155.00	$456,581.75
	105003	Permits	DLR	4000	$ 1.00	$4,000.00	$1.00	$4,000.00
	105004	Remove Guidance Sign	EA	8	$ 500.00	$4,000.00	$525.00	$4,200.00
	108001	No. 8 AWG, 5KV, L-824, Type C, Cable, Installed in Trench, Duct Bank or Conduit	LFT	7500	$ 2.50	$18,750.00	$1.50	$11,250.00
	108002	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed in Trench, Including Connections/Terminations	LFT	7400	$ 2.00	$14,800.00	$2.50	$18,500.00
	108003	REIL Interconnect Cable, Installed in Trench, Duct Bank or C	LFT	400	$ 5.00	$2,000.00	$3.50	$1,400.00
	110001	Non-Encased Electrical Conduit, HDPE, 1 1/2"	LFT	7400	$ 4.50	$33,300.00	$7.25	$53,650.00
	110002	Non-Encased Electrical Conduit, PVC, 3"	LFT	400	$ 7.00	$2,800.00	$13.00	$5,200.00
	110003	Extend Non-Encased Electrical Conduit, 3"	LFT	50	$ 15.00	$750.00	$20.00	$1,000.00
	110004	Extend Non-Encased Electrical Conduit, 4"	LFT	25	$ 20.00	$500.00	$25.00	$625.00
	115001	Junction Can, Size D	EA	8	$ 500.00	$4,000.00	$1,500.00	$12,000.00
	125001	L-861, Salvaged and Reinstalled, Base Mounted	EA	33	$ 750.00	$24,750.00	$1,725.00	$56,925.00
	125002	L-858R(L), Size 1, Style 2, Class 1, Mode 2, Guidance Sign, Pad Mounted	EA	9	$ 2,500.00	$22,500.00	$5,300.00	$47,700.00
	152001	Unclassified Excavation	CYD	3534	$ 10.00	$35,340.00	$18.00	$63,612.00
	152002	Subgrade Undercutting	CYD	400	$ 30.00	$12,000.00	$26.00	$10,400.00
	154001	Subbase Course	CYD	2800	$ 25.00	$70,000.00	$31.00	$86,800.00
	207001	In-Place Full Depth Recycled (FDR) Asphalt Aggregate Base Course	SY	69964	$ 2.00	$139,928.00	$1.37	$95,850.68
	207002	Fine Grade and Compact Asphalt Aggregate Base Course	SY	66185	$ 1.00	$66,185.00	$2.02	$133,693.70
	207003	Asphalt Aggregate Base Course	CYD	910	$ 7.50	$6,825.00	$9.00	$8,190.00
	207004	Remove and Stockpile FDR Asphalt Aggregate Base Course	CYD	6000	$ 10.00	$60,000.00	$0.01	$60.00
	401001	Bituminous Surface Course, Gradation 2	TON	18613	$ 110.00	$2,047,430.00	$81.10	$1,509,514.30
	603001	Emulsified Asphalt Tack Coat	GAL	5695	$ 3.00	$17,085.00	$3.00	$17,085.00
	620001	Airfield Pavement Marking, Half-Rate, Yellow	SF	6303	$ 0.50	$3,151.50	$0.40	$2,521.20
	620002	Airfield Pavement Marking, Half-Rate, White	SF	37687	$ 0.50	$18,843.50	$0.40	$15,074.80
	620003	Airfield Pavement Marking, Full-Rate, Yellow	SF	10776	$ 0.75	$8,082.00	$0.59	$6,357.84
	620004	Airfield Pavement Marking, Full-Rate, White	SF	37687	$ 0.75	$28,265.25	$0.59	$22,235.33
	620005	Airfield Pavement Remarking, Full-Rate, Yellow	SF	0	$ 1.00	$0.00	$0.59	$0.00
	621001	Sawcut Runway Grooves	SY	46053	$ 2.00	$92,106.00	$3.35	$154,277.55
	705001	6 Inch Underdrain	LFT	1400	$ 8.00	$11,200.00	$16.00	$22,400.00
	705002	6 Inch Underdrain Pipe End Section	EA	2	$ 100.00	$200.00	$224.00	$448.00
	901001	Seeding	AC	5	$ 2,500.00	$12,500.00	$1,420.00	$7,100.00
	905001	Topsoiling, Furnished from Off the Site	CYD	1400	$ 30.00	$42,000.00	$0.01	$14.00
	908001	Mulching	AC	5	$ 2,500.00	$12,500.00	$1,000.00	$5,000.00
					TOTAL =	$3,283,891.25	TOTAL =	$3,230,276.65
					Percent of Low Bid: 101.66%		Percent of Low Bid: 100.00%	
					Percent of Estimate: 100.00%		Percent of Estimate: 98.37%	

Category 1	$3,283,891.25	Category 1	$3,230,276.65
Category 2	$298,704.50	Category 2	$310,229.20
Total	$3,582,595.75	Total	$3,540,505.85

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BID TABULATIONS

PROJECT:	Rehabilitate Runway 2-20 Lighting
LOCATION:	Antrim County Airport
AIP:	Bellaire, MI
CITY:	5/15/2020
DATE:	
PREPARED BY:	SCT, AMH

Mead & Hunt

WORK DESCRIPTION:	Runway 1-19 Rehabilitation. Full depth reclamation, includes connectors to hold line and taxiway turn arounds on Runway 1 and 19 ends.

CATEGORY TWO - STATE APPORTIONMENT					Engineer's Opinion of Probable Cost		Michigan Paving and Materials 2300 Gelndenning Road Kalamazoo, MI 49001	
	ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	ITEM COST	UNIT PRICE	ITEM COST
	100001	Contractor Quality Control Program (CQCP)	LS	0.15	$50,000.00	$7,500.00	$119,600.00	$17,940.00
	105001	Mobilization	LS	0.15	$350,000.00	$52,500.00	$346,130.00	$51,919.50
	105002	Safety and Security	LS	0.15	$150,000.00	$22,500.00	$537,155.00	$80,573.25
	105003	Permits	DLR	1000.00	$1.00	$1,000.00	$1.00	$1,000.00
	152002	Subgrade Undercutting	CYD	100.00	$30.00	$3,000.00	$26.00	$2,600.00
	207001	In-Place Full Depth Recycled (FDR) Asphalt Aggregate Base Course	SY	10083.00	$2.00	$20,166.00	$1.37	$13,813.71
	207002	Fine Grade and Compact Asphalt Aggregate Base Course	SY	9539.00	$1.00	$9,539.00	$2.02	$19,268.78
	207004	Remove and Stockpile FDR Asphalt Aggregate Base course	CYD	1000.00	$10.00	$10,000.00	$0.01	$10.00
	401001	Bituminous Surface Course, Gradation 2	TON	1361.00	$110.00	$149,710.00	$81.10	$110,377.10
	603001	Emulsified Asphalt Tack Coat	GAL	2017.00	$3.00	$6,051.00	$3.00	$6,051.00
	620001	Airfield Pavement Marking, Half-Rate, Yellow	SF	1587.00	$0.50	$793.50	$0.40	$634.80
	620003	Airfield Pavement Marking, Full-Rate, Yellow	SF	4756.00	$0.75	$3,567.00	$0.59	$2,806.04
	620005	Airfield Pavement Remarking, Full-Rate, Yellow	SF	1378.00	$1.00	$1,378.00	$0.59	$813.02
	901001	Seeding	AC	1	$2,500.00	$2,500.00	$1,420.00	$1,420.00
	905001	Topsoiling, Furnished from Off the Site	CYD	200	$30.00	$6,000.00	$0.01	$2.00
	908001	Mulching	AC	1	$2,500.00	$2,500.00	$1,000.00	$1,000.00
					TOTAL =	$298,704.50	SUBTOTAL =	$310,229.20
					Percent of Low Bid: 96.29%		Percent of Low Bid: 100.00%	
					Percent of Estimate: 100.00%		Percent of Estimate: 103.86%	

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EXHIBIT 1

KIRSCH MUNICIPAL AIRPORT
STURGIS, MICHIGAN

Project No. I-26-0092-2020
Job No. 132221CON

July 31, 2020

	Federal	State	Local	Total
PLANNING	$0	$0	$0	$0
DESIGN	$0	$0	$0	$0
CONSTRUCTION	$3,774,356	$0	$0	$3,774,356
Rehabilitate Runway 18/36 (5201' x 100') - FY 20 AIP @ 100% Federal	$3,540,506	$0	$0	$3,540,506
Consultant contract fee - FY 20 AIP @ 100% Federal	$233,850	$0	$0	$233,850
TOTAL PROJECT BUDGET	**$3,774,356**	**$0**	**$0**	**$3,774,356**

Federal Billing Breakdown:

Bill #1	$1,564,356	SBGP 11220	Grant Award Date: 5/20/20
Bill #2	$2,210,000	SBGP 12020	Grant Award Date: Pending

Letting Information: 05/15/20

Period of Performance End Date: 06/01/22

MAC Approval: 07/29/20

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City of Sturgis
City Commission
Regular Meeting

Agenda Item 10E

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PROJECT / ISSUE ANALYSIS REPORT

DATE: September 16, 2010
DEPARTMENT: Administrative Services
PREPARING STAFF MEMBER: Kenneth Rhodes

City Hall Hours

Executive Summary

In light of increasing budget constraints, one possible cost savings measure would include a reduction of hours in which City Hall is open to the public. The potential savings from staff reductions must be weighed against the ability of residents/customers to receive a superior level of customer service.

Recommendation: To maintain City Hall hours open to the public on Monday, Wednesday, Thursday, and Friday between 9:00 a.m. and 5:00 p.m.

Background

An optimal level of staffing has been the goal in all City Hall departments to provide superior customer service. Over the past several years, the number of employees has been reduced at City Hall, most often with an adjustment of duties after an employee has left the City. The level of service available to residents is a key factor in determining the amount of staff required. The amount of interaction with the public and various City Hall departments can be broken down as follows:

*1) **FREQUENT** – Clerk, Treasurer, Utility Billing*

These departments are available to the public to receive payments, begin/end utility service, voter needs, and property information.

*2) **MODERATE** – Community Development, Assessing, City Manger, EDC Director, and HR*

The Community Development department deals with contractors, homeowners, and landlords for property related issues.

The Assessing department deals with property owners and is currently only available at most three times per week.

The City Manager and EDC Director have many appointments but also can have unscheduled inquiries.

The Human Resources department will meet with current and former employees.

*3) **INFREQUENT** – Controller, Information Technology, Engineer*

These departments are primarily engaged in providing service to other City departments.

Citizen Input

A review of the activity at the Clerk/Treasurer's office has shown that over half of customer's come into the office on Monday's and Friday's with the remaining visits being equally spread across Tuesday, Wednesday, and Thursday.

Alternatives

1. Continue the same 40 hour, Monday – Friday, 9 a.m. – 5 p.m. schedule.
2. Close to the public one day per week but maintain same work schedule for employees.
3. Close to the public two days per week and change employee's schedule to four 10 hour days.

Analysis

Alternative 1: Continue the same 40 hour, Monday – Friday, 9 a.m. – 5 p.m. schedule.

Although modifications to duties have and will continue to occur, there is little opportunity for staff reductions without a change in the level of service. Positions and tasks continue to be reviewed and additional duties have been added to current staff members. However, there is a limit to the amount of responsibilities that can be added given the amount of live interaction with residents. Over the next 24 months, as many as four employees plan to retire, and a continuation in the same level of service will most likely result in the need to replace each of these positions. This alternative will allow City Hall staff to provide the same superior customer service that it has historically provided.

> **Savings for Alternative : $0.00** There is little opportunity for any cost savings under this alternative because of the need to replace staff and in fact will increase the overall budget because of legacy retirement costs.

Alternative 2: Close to the public one day per week but maintain same work schedule for employees.

Although there are many opportunities with this alternative, there are a number of considerations that must be reviewed. Currently, residents know that they can come into City Hall at any time during the work week and there is little need to make an appointment; requiring residents to plan their visits does not seem a difficult burden. Many customers also pay their bills in person when there are many other outlets to accomplish this. Currently, customers can mail their payment, view and pay their account online, and access the Treasurer's drop box 24 hours a day. Other utilities have little or no access to pay in person so residents are already accustomed to making other payment arrangements. When setting up utility service, we require certain interactions but our procedures can be reviewed under this scenario. For those departments with a moderate or infrequent level of public interaction, appointments can be adjusted to accommodate when City Hall is open; if an appointment is critical, there is no reason that an employee could not meet with a citizen on any day.

The main advantage to closing the doors to the public would be to complete certain responsibilities in a timely manner without interruption. Currently tasks such as the printing of bills or processing payroll occurs during the workday and is often slowed because of interaction with live customers; the current level of staffing allows these tasks to be accomplished because one employee can work with the public and free time for the other. By being closed to the public, one employee can complete certain tasks more efficiently thus allowing for a reduction in staffing. The exact number of FTEs that could be reduced would have to be reviewed so that all responsibilities could be completed properly; sufficient coverage would be necessary during times employees are away from the office (vacation, sick, conferences).

Another benefit from being closed to the public would be to allow for significant cross-training. Obviously with a smaller staff, each employee must be prepared to assist with a variety of responsibilities and adjust their focus to the most critical tasks when necessary. Currently, City Hall employees report to the office one half hour before the doors are unlocked. Although this has been beneficial with completing certain duties, it has not proven to be a sufficient amount of time for proper cross training.

> **Savings for Alternative : $50,000+** If only one FTE was not replaced, then the overall City budget would realize savings of approximately $50,000; any additional staff reductions could allow for even greater savings. It should be noted that because of the formula for administrative reimbursement, the savings would be spread across the General, Special Revenue, and Utility funds.

<u>Alternative 3</u>: Close to the public two days per week with possible changes to employee work hours.

Using the same logic as Alternative 2, citizens could alter their habits to receive the necessary services from City Hall staff. Obviously this is a more dramatic change to our current mode of operation. One possible change under this scenario would be to allow for some flex scheduling and to offer late business hours on a particular day. Currently, our utility policy requires our office to be open for two consecutive days after a customer is disconnected so this would have to be reviewed. The expectation under this alternative is that there would be even more room for staff reductions and/or greater use of part time help.

> **Savings for Alternative : $50,000+** Similar to Alternative 2 but possibly could realize even greater savings.

Recommendation

Alternative 2: Close to the public one day per week but maintain same work schedule for employees. Although there is no doubt that savings would be realized and customer needs can be satisfied by closing to the public one day per week, it would be prudent to observe this change before moving to a three day week.

Action Plan

If the Commission approves the recommended plan, a media release and educational flyer will be prepared to inform the public. Internally, extensive cross-training will begin amongst Administrative Services staff. One month should be sufficient to implement the change after Commission approval.

Signed and Reviewed

PREPARING STAFF MEMBER	CITY MANAGER REVIEWED
Kenneth D. Rhodes Clerk/Treasurer's Office	Michael L. Hughes City Manager

City of Sturgis
City Commission
Regular Meeting

Agenda Item 10F

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TO: Michael L. Hughes, City Manager
FROM: Holly Keyser, City Controller
SUBJECT: 2019-2020 Proposed Budget Amendment
DATE: September 8, 2020

In accordance with the Uniform Budgeting and Accounting Act, the following governmental funds need to be amended to reflect changes in the expected revenue and operating expenditures anticipated in the 2019-2020 fiscal year, as compared to those originally estimated in the 2019-2020 approved budgets as previously amended.

	Original Budget As Amended	Increase/ (Reduction)	Proposed Budget
General Fund - 101			
Revenue	9,038,440	374,730	9,413,170
Expenditures	9,297,620	378,725	9,676,345
Change in Fund Balance	(259,180)	(3,995)	(263,175)
Beginning Fund Balance	1,875,965	-	1,875,965
Projected Ending Fund Balance	1,616,785	(3,995)	1,612,790

The General Fund budgeted revenue was modified due to the following:

Local Community Stabilization Authority	*414,730.00*
School Resource Officer Funding	*(40,000.00)*
	374,730.00

The General Fund budgeted expenditures were modified due to the following:

Contribution to Building Fund	*(36,000.00)*
Contribution to Capital Reserve Fund	*614,725.00*
Capital Outlay	*(200,000.00)*
	378,725.00

Drug Enforcement Fund - 213			
Revenue	2,010		2,010
Expenditures	19,140	10,000	29,140
Contribution from General Fund	12,000	-	12,000
Change in Fund Balance	(5,130)	(10,000)	(15,130)
Beginning Fund Balance	25,527	-	25,527
Projected Ending Fund Balance	20,397	(10,000)	10,397

The Drug Enforcement Fund is amended to reflect the updated estimated expe

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Building Fund - 249			
Revenue	50,500		50,500
Expenditures	121,570		121,570
Contribution from General Fund	36,000	(36,000)	-
Change in Fund Balance	(35,070)	(36,000)	(71,070)
Beginning Fund Balance	160,849	-	160,849
Projected Ending Fund Balance	125,779	(36,000)	89,779

The Building Fund is amended to eliminate the contribution from the General Fund.

Capital Reserve Fund - 401			
Revenue	7,500		7,500
Expenditures	185,000		185,000
Contribution from General Fund	396,000	614,725	1,010,725
Change in Fund Balance	218,500	614,725	833,225
Beginning Fund Balance	2,055,613	-	2,055,613
Projected Ending Fund Balance	2,274,113	614,725	2,888,838

The Capital Reserve Fund is amended for the additional contribution from the General Fund.

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