



300 E. Locust Street, Ste. 100
Des Moines, Iowa 50309
515-244-0021

MEMORANDUM

DATE: October 20, 2021

TO: MWA Board Members

CC: MWA Staff

FROM: Michael McCoy, Executive Director

RE: Wednesday, Oct. 20, 2021, Board Meeting

This month's board meeting is scheduled for Wednesday, Oct. 20, 2021, at 5:45 pm in the board room at Central Office (300 East Locust Street, Ste. 100, Des Moines, Iowa). If you have questions about any items listed below, please call me at 323.6519 (w) or 707.3869 (c). I look forward to seeing you on Wednesday.

The following numbered items correspond with the number of the item on the agenda:

Consent Agenda Items for Approval

6. Resolution 10-21-01 - Consideration of June 2021, Financial Statements
7. Resolution 10-21-02 - Consideration of July 2021, Financial Statements
8. Resolution 10-21-03 - Consideration of September 2021, Monthly Expenditures
9. Resolution 10-21-04 - Approval of Ordering Spare Parts for MRF Equipment
On August 21, 2019, the Metro Waste Authority Board approved the equipment vendor, CP Manufacturing, Inc, for the MWA MRF. The contract with the vendor was approved on October 16, 2019. Per the Request for Proposal, the contract included a list of recommended spare parts.
10. Resolution 10-21-05 - Approval of Change Order for MRF Education Center
Change Order of \$38,478 with Split Rock Studios to finalize exhibit design at the MRF for a total project cost of \$306,033.

Regular Agenda Items for Approval

11. Resolution 10-21-06 – Approval to Reject Phase 1 Closed Stormwater Repair Bids at Metro Park East Landfill – Action Item
The bids were substantially higher than the Engineers Estimate. MWA can place some temporary structures in place to prevent spring run-off from entering the landfill leachate

collections system. A Cell construction project is scheduled for MPE next spring. The Phase I Closed Area Stormwater Repair project can be bid as part of the spring cell construction project. This should allow for more competitive bids.

12. Resolution 10-21-07 – Approval of Contract SloanVazquezMcAfee Municipal Solid Waste Advisors – Action Item
Metro Waste Authority has established a relationship with SloanVazquezMcAfee during the design and construction phase of the Metro Recovery Facility (MRF). A scope of work was developed, along with two agreements to contract with the firm to conduct the commissioning and the initial management and training associated with the facility.
13. Resolution 10-21-08 – Approval of Public Improvement at Central Office– Action Item
MWA seeks bids from qualified and experienced contractors for designing, engineering, building, maintaining, and installing a rooftop ballasted solar photovoltaic (PV) project.



**Board of Directors
2021 Calendar Year**

Ron Pogge
Chair

David Gisch
Vice-Chair

Dean O'Connor
Altoona

Mark Holm
Ankeny

Wes Enos
Bondurant

John Edwards
Clive

Joe Gatto
Des Moines

Steve Allen
Elkhart

David Gisch
Grimes

Tom Cope
Johnston

Bill Roberts
Mitchellville

Ed Kuhl
Norwalk

Dean Cooper
Pleasant Hill

Rob Sarchet
Polk City

Tom Hockensmith
Polk County

Gerald Lane
Runnells

Ron Pogge
Urbandale

Steve Gaer
West Des Moines

Susan Skeries
Windsor Heights

Michael McCoy
Executive Director

**Metro Waste Authority
Board Meeting
October 20, 2021**

MWA Central Office
300 E. Locust Street, Ste. 100, Des Moines, Iowa 50309
5:45 pm

Members of the public wishing to attend this meeting in person may do so at the MWA Central Office, where seats will be arranged to allow for social distancing. Masks will be available and are mandatory for public guests. Additional CDC recommendations will be implemented.

**Meeting ID: 826 8473 7642
Passcode: 739764**

Agenda

1. Call to Order, Roll Call
2. Approval of Regular Agenda
3. Public Forum

CONSENT AGENDA

The following are routine items enacted by one roll call vote without separate discussion unless someone, Board or Public, requests an item be removed for consideration:

4. Approval of Consent Agenda – Items 4 through 10
5. Consideration of Minutes September 15, 2021, Metro Waste Authority Board Meeting – Action for Approval
6. Resolution 10-21-01 - Consideration of June 2021, Financial Statements – Action to Receive and File
7. Resolution 10-21-02 - Consideration of July 2021, Financial Statements – Action to Receive and File
8. Resolution 10-21-03 – Consideration of September 2021, Monthly Expenditures – Action for Approval
9. Resolution 10-21-04 – Approval of Ordering Spare Parts for MRF Equipment - Action for Approval
10. Resolution 10-21-05– Approval of Change Order for MRF Education Center - Action for Approval

END CONSENT AGENDA

Regular Agenda Items for Approval – Items 11 through 13

11. Resolution 10-21-06 – Approval to Reject Phase I Closed Stormwater Repair Bids at Metro Park East Landfill – Action Item

12. Resolution 10-21-07 – Approval of Contract SloanVazquezMcAfee Municipal Solid Waste Advisors – Action Item
13. Public Hearing to Approve Public Improvement at Central Office
Resolution 10-21-08 – Approval of Public Improvement at Central Office– Action Item
14. Director’s Report
15. Chair’s Report
16. General Board Discussion and Other Business
17. Correspondence
18. Adjournment

November Executive/Finance Meeting: November 3, 2021, MWA Central Office, 300 E. Locust Street, Ste 100, Des Moines, Iowa 50309, 12:00 pm.

November Board Meeting: November 17, 2021, MWA Metro Recycling Facility, 4185 SE Beisser Drive, Grimes, Iowa 50111, 5:45 pm.



300 E. Locust Street, Ste. 100
Des Moines, Iowa 50309
515-244-0021

September 15, 2021 Unofficial Metro Waste Authority Board Meeting Minutes

1. Call to Order

The meeting was held at Metro Waste Authority's Central Office. Ron Pogge, chair, called the September 15, 2021, Metro Waste Authority Board Meeting to order at 5:45 pm. A quorum was present.

Roll Call – MWA Board Representatives/Alternates in Attendance

Mark Holm, Ankeny, Virtual
John Edwards, Clive, Virtual
Joe Gatto, Des Moines, Virtual
David Gisch, Grimes, Virtual
Tom Cope, Johnston, Virtual
Bill Roberts, Mitchellville, In Person
Dean Cooper, Pleasant Hill, Virtual
Rob Sarchet, Polk City, Virtual
Tom Hockensmith, Polk County, Virtual
Ron Pogge, Urbandale, In Person
Bret Hodne, West Des Moines, Virtual
Mike Loffredo, Windsor Heights, Virtual

2. Approval of Regular Agenda

Moved by Clive, seconded by Des Moines, to approve the September 15, 2021, board meeting agenda as presented. Motion carried unanimously by voice vote.

3. Public Forum

There were no requests to address the Board.

CONSENT AGENDA

The following are routine items enacted by one roll call vote without separate discussion unless someone, Board or Public, requests that an item be removed for consideration:

4. Approval of Consent Agenda – Items 4 through 10

Moved by Des Moines, seconded by West Des Moines, to approve the Consent Agenda, items 4 through 10. Motion carried unanimously by voice vote.

5. Consideration of Minutes of July 21, 2021, Metro Waste Authority Board Meeting – Action for Approval

6. Resolution 09-21-01 - Consideration of May 2021, Financial Statement – Action to Receive and File

7. Resolution 09-21-02 - Consideration of July 2021, Monthly Expenditures – Action for Approval

8. Resolution 09-21-03 - Consideration of August 2021, Monthly Expenditures –

Action for Approval

9. Resolution 09-21-04 - Approval of Extension of Revenue Sharing with Respect to the Collection of Solid Waste - Action for Approval
10. Resolution 09-21-05 - Approval to Authorizing the Executive Director to Execute a Settlement Agreement Prepared by ICAP to Resolve Outstanding Employment Litigation Claim - Action for Approval

END CONSENT AGENDA

Regular Agenda Items for Approval - Items 11 and 12

11. Resolution 09-21-06 - Approval of IT Personnel for Metro Waste Authority – Action Item
Moved by Polk County, seconded by Clive, to approve Resolution 09-21-06. Motion carried unanimously by voice vote.

Michael McCoy, executive director, reported request for IT personnel is coming out of timing with the budget, however, Metro Waste Authority (MWA) has money from open positions that would bring us to June. MWA would save around \$102,000.00 to 105,000.00 per year by internalizing IT needs.

Board members and Matt Stoffel, PFM consultant, shared their support for internalizing this position at MWA.

12. Resolution 09-21-07 – Setting Public Hearing for Public Improvement at Central Office - Action Item
Moved by Clive, seconded by Johnston, to approve Resolution 09-21-07. Motion carried unanimously by voice vote.

McCoy reported municipal entities in Iowa are required to follow Iowa Code Chapter 26 bid procedures when contracting for public improvement projects (such as adding solar panels to a building). The public hearing would be set for next month's board meeting, October 20, 2021, at 5:45 pm.

13. Director's Report
McCoy reported staff completed the first punch list walk through at the Material Recovery Facility last week. Furniture is being installed this week; PJ Gasparovich, maintenance manager at the MRF, has begun working onsite. The November board meeting will be held at the MRF.

McCoy reported Graham Construction and Christensen Development have been handling the Graphite situation wonderfully. Graham will be conducting a full payroll audit this week to ensure all subcontractors are being paid correctly.

McCoy reported the top turner arrived at Metro Park East Landfill and staff have already started using it. Sales have started again for compost.

McCoy reported hosting Scott and Linn County Landfill/MRF staff and respective executive directors to learn more about MWA's systems.

The October executive finance meeting will be held at Central Office (300 E. Locust Street, Ste. 100, Des Moines, Iowa) on Wednesday, Oct. 6, 2021, at 12:00 pm.

The October board meeting will be held at Central Office (300 E. Locust Street, Ste. 100, Des Moines, Iowa) on Wednesday, Oct. 20, 2021, at 5:45 pm.

14. Chair's Report

Ron Pogge, chair, shared compliments to Des Moines Police for their assistance in a recent phishing occurrence at MWA.

15. General Board Discussion and Other Business

No report.

16. Adjournment

Moved by Polk County, seconded by Clive, to adjourn the September 15, 2021, board meeting. Motion carried unanimously by voice vote. Meeting adjourned at 6:29 pm.

Michael McCoy, Executive Director

Ron Pogge, Chair


**METRO WASTE AUTHORITY
BILLS PAID IN SEPTEMBER 2021**

Vendor Name	Services Provided	Amount
ABM PARKING	Parking	6,000.00
AFLAC	Insurance premium	476.64
ALLENDER BUTZKE ENGINEERS, INC.	Engineering fees	5,643.76
ANKENY SANITATION	Waste/drooff/contract exns	512,886.01
ARAMARK UNIFORM SERVICES INC.	Raas/mats/sunnlies	55.40
ATLANTIC BOTTLING COMPANY	Office sunnlies	57.92
BOMGAARS	Parts/small tools/sunnlies	56.99
BOOT BARN	Health/safetv	115.16
BRICK GENTRY P.C.	Leaal fees	26,180.50
CENTRAL STATES ROOFING	MRF	14,856.10
CITY GARDENS, INC	Site maintenance	8,420.00
CLEAN DES MOINES. INC.	Janitorial services	1,104.00
CLEAN HARBORS ENV. SERVICE INC	Contract disoosal	15,545.94
COMMONWEALTH ELECTRIC COMPANY	Site maintenance	11,937.46
DES MOINES MOBILE WASH, INC	Preventive maintenance	920.00
DES MOINES WATER WORKS	Utilities	6,044.70
DES MOINES CITY OF	Lease/leachate processing	13,043.35
DIAM PEST CONTROL	Pest control	120.00
EMSL ANALYTICAL INC	Asbestos testing	208.00
ETC GRAPHICS INC.	Signage	87.50
EXCEL MECHANICAL CO., INC.	MRF	123,688.10
EXPRESS LAUNDRY	Floor mats	125.00
FERRELLGAS	Utilities/equipment fuel	882.99
FINISHING TOUCHEZ	Site maintenance	249.66
FLYNN WRIGHT	Public information/promotion	41,387.65
FREIGHTLINER OF DES MOINES INC	Parts	226.81
GRIMES, CITY OF	Utilities	1,853.39
HAWKEYE FIRE & SAFETY CO	Equipment repairs	190.90
HOUSBY HEAVY EQUIPMENT	Parts/labor/preventive maint	8,864.06
HOUSBY MACK, INC.	Parts/labor/preventive maint	1,682.63
INLAND TRUCK PARTS CO.	Parts/labor/preventive maint	156.60
IOWA DES MOINES SUPPLY	Janitorial sunnlies	799.90
IPERS	Employee's share of IPERS	40,321.28
JACQUELINE WILL	Mileage/expenses	80.64
KABEL BUSINESS SERVICES	Employee benefit expense	6,807.42
KABEL BUSINESS SERVICES	Service fees	79.30
MAILFINANCE INC	Mail expense	1,409.82
MCANINCH	MRF	45,405.49
MCMaster-CARR SUPPLY CO.	Leachate maintenance/collection	513.41
MHC KENWORTH - DES MOINES	Parts/labor/preventive maint	8,145.42
MIDAMERICAN ENERGY	Utilities	3,890.97
MIDLAND POWER COOPERATIVE	Utilities	1,905.53
NATIONWIDE OFFICE CLEANERS LLC	Janitorial services	34.89
ODORGON	Parts	452.18
O'HALLORAN INTERNATIONAL, INC.	Parts/labor/preventive maint	11,590.14
O'REILLY AUTO PARTS	Parts/small tools/sunnlies	1,267.55
PER MAR	Security	121.00
PERFICUT COMPANIES INC	Site maintenance	1,427.40
PETERSON CONTRACTORS, INC.	Contracted fly ash hauler	10,368.15
POMPS TIRE SERVICE INC.	Tire/track repairs	7,583.61
PROSPERITY JANITORIAL	Janitorial services	2,608.68
PROSPERITY JANITORIAL	trash o/u	160.00
PROSPERITY JANITORIAL	sanitizing	720.00
PROSPERITY JANITORIAL	Caret clean	475.00
QUICK OIL CO.	Equipment fuel	5,213.85
SOCIAL SECURITY ADMINISTRATION	Employee's share of FICA	34,835.60
TESTAMERICA LABORATORIES, INC	Environmental monitoring	2,243.75
TIFCO INDUSTRIES	Parts/small tools/sunnlies	777.23
TITAN MACHINERY	Parts	1,931.94
TREASURER STATE OF IOWA	Sales tax	11,772.47
TRI-CITY ELECTRIC CO OF IOWA	MRF	70,508.83


TRUENORTH COMPANIES	Dues/subscriotion/fee	2,500.00
VANTAGEPOINT TRANSFER AGENTS	Emolover's share deferred comnensation	8784.15
VERIZON WIRELESS	Comouter sunnlies/niaintenance	387.61
WASTE CONNECTIONS INC.	Waste collection/tire orocessi	138 019.45
WASTE MANAGEMENT OF IOWA	Curbside/drop off/waste coll	539 864.52
WEST BANK	Credit card oavment for misc office and travel exnses	73,684.94
WEST BANK	Service fees	230.67
WEST BANK	Gift cards for service awards	1,090.00
WILLIAMSON'S REPAIR	Eauioment maintenance	52.98
ZIEGLER INC.	Part/labor/orev maint/subscri	5,761.84
ACCESS SYSTEMS	Office printina	332.50
AMERICAN MARKING INC.	Office sunnlies	93.50
AMERICAN SECURITY	Security	460.72
CENTRAL IOWA MECHANICAL	Site maintenance	11,919.00
CENTRAL UNITED LIFE INSURANCE	Life insurance	304.44
CHAMPLIN TIRE RECYCLING INC	Tire orocessina	3,699.15
CONTROLLED ACCESS OF THE MIDWEST LLC	Site maintenance	91.00
CPI TECHNOLOGIES LLC	Phone svstem	6,121.07
DAN'S OVERHEAD DOORS 4	Buildina reoairs	341.32
DARYLE J BENNETT II	Buildina services	300.00
DES MOINES REGISTER THE	Advertisino	408.56
DES MOINES SOLID WASTE	Yard waste collection	111478.07
DEX MEDIA EAST	Advertisino	1 575.00
Doors Inc	Kev/swap lock	540.00
ECOSOURCE LLC	Well maintenance	2 500.00
FERGUSON ENTERPRISES INC	APPLIANCE	10 318.20
FOX VALLEY FIRE & SAFETY CO INC	Parts/labor	8 088.40
GENUINE PARTS	Parts	1,409.11
GRAPHITE CONSTRUCTION GROUP INC	MRF	304,186.78
HANIFEN CO. INC.	Parts/labor	100.00
HOR ENGINEERING INC.	En ineerinQ services	183.50
HEARTLAND CO-OP	Eouioment fuel	830.00
HIRERIGHT SOLUTIONS INC.	Health/safety	33.65
HOLM'S/AMERICAN RADIATOR LLC	Parts/labor	3,802.00
IMWCA	WC insurance	30,520.00
IOWA DEMOLITION	MRF	750.00
IOWA DEPARTMENT OF NATURAL RESOURCES	DNR Quarterly Tonnaoe Fees	437,727.16
ISCO INC.	Leachate well maintenance	141.66
J PETTIECORD	Eauioment rent	800.00
J. A. KING & CO	Site maintenance/oarts	664.17
JASPER COUNTY TREASURER	Prooerty taxes	4 162.00
JOHNSON CONTROLS, INC.	Site maintenance	855.00
JO-RO ENTERPRISES LTD	Site maintenance	239.50
KENWORTH MID-IOWA INC.	Parts/nreventive maintenance	2,020.60
KIERRA HORTON	Mileaaae/exnses	165.76
KNAPP PROPERTIES	Buildina services	1,490.00
KNAPP PROPERTIES	Manaaement Fee	2,179.84
LUBE-TECH & PARTNERS, LLC	Eauioment fuel	13,439.23
MILESAWAY	SmartSian	69.20
MMC CONTRACTORS IOWA, INC.	Blda reoairs/site maintenance	4,993.94
NAPA DISTRIBUTION CENTER	Parts/small tools/sunnlies	112.84
ONE SOURCE	Backaround checks	88.60
OTIS	Elevator insoection	750.00
OTIS	Reolace hvdrolc oil	3 700.80
OVERHEAD DOOR COMPANY	Buildina maintenance	1102.12
P & P SMALL ENGINES, INC.	Parts	247.91
PAYLOCITY	Processina fee	1 616.25
POLK COUNTY TREASURER	Prooerty taxes	85 578.00
PRAXAIR DISTRIBUTION INC.	Weldina sunrlies	1,232.95
RALPH N SMITH INC	Carnet install	436.00
RDO INTEGRATED CONTROLS	Parts/labor	1,604.32
ROBERT HARDING	Tool allowance	100.00
SAFETY-KLEEN SYSTEMS INC	SunnJies	335.01
SCOTT'S AUTO GLASS LLC	Parts/labor	1 600.00
SGS ENGINEERS, PC	Enc ineerina services	48 762.43
SGS FIELD SERVICES	Enc ineerina services	6 235.80
SENECA TANK	Parts	310.00

SINK PAPER & PACKAGING	Yard baa storaee/distribution	2 155.32
SOIL CONTROL LAB	Environmental monitorina	698.00
STRAUSS SECURITY SOLUTIONS	Securit"	236.00
SUMMIT ELECTRIC LLC	Outlets	1 300.00
THE UNIVERSITY OF IOWA	MWA°rant	520.49
TOMPKINS INDUSTRIES INC.	Parts	176.78
TRANSPORT REFRIGERATION INC.	Preventive maintenance	2 689.66
VALLEY ENVIRONMENTAL SERVICES	Contract dis°osal	1 192.60
VAN MAANAN TECHNOLOGY INC	data ;ack	60.00
VAN WALL EQUIPMENT	Parts/labor/°reventive main!	1 831.39
VERMEER SALES & SERVICE INC.	Parts	5987.17
WASTE SOLUTIONS OF IOWA	Buildinn services	760.00
WAYNE DALTON OF CENTRAL IOWA	Buildinn renairs	261.50
WEIGHTS & MEASURES BUREAU	Site nermit	756.00
WEST DES MOINES, CITY OF	Advertisinn	2,000.00
WRIGHT OUTDOOR	Buildinn services	178.00
Grand Total		2,990,844.80

The MWA Executive Director and the Accounting Manager certify that the above MWA bills paid are properly due and have been made in accordance with the operating and expenditure processes established by MWA.



Michael McCoy, Executive Director



Sue Nielsen, Accounting Manager

Metro Waste Authority Board
Monthly Board Meeting
October 20, 2021
Agenda Item 9

ITEM:

Approval of Ordering Spare Parts for the Material Recovery Facility (MRF) Equipment

SUMMARY:

On August 21, 2019, the Metro Waste Authority Board approved the equipment vendor, CP Manufacturing, Inc, for the MWA MRF. The contract with the vendor was approved on October 16, 2019. Per the Request for Proposal, the contract included a list of recommended spare parts.

DISCUSSION POINTS:

MWA advisors, including Waste Commission of Scott County, CP equipment experts, and SloanVanquezMcAfee, have recommended that the identified critical spare parts be kept on site at the MRF for expediting repairs and avoiding down time.

STAFF RECOMMENDATION:

Staff recommends approval to order the recommended critical spare parts in the amount of \$240,550.79.

BUDGET REQUIREMENTS:

Funds for the \$240,550.79 purchase are budgeted in Capital Expenses FY21/22.

ATTACHMENTS:

Critical Spare Parts List

CONTACT:

Michael McCoy, executive director, 515.323.6523



Job 5947 • Metro Waste Authority
Main Equipment Critical Spare Parts List

Item / Assembly	Quantity	Part Number	Description	Price EA	Extended Price
MSS UNITS	24	40-00000055	BULB, LAMP, HALOGEN, 100W, 120V, R7S BASE, T3 BULB SHAPE	\$ 6.93	\$ 166.32
MSS UNITS	5	40-00000067	BULB, INCANDESCENT, QUARTZ-HALOGEN, 2-PIN, T2-1/2 G4 BASE, 20W 24VDC.	\$ 4.95	\$ 24.75
MSS UNITS	3	40-00000268	AIR FILTER CARTRIDGE, HEPA, 4-3/8" ID X 8-1/2" L	\$ 71.28	\$ 213.84
MSS UNITS	1	40-00000030	Filter, AC, HOFFMAN (nVent), 89068405SP	\$ 137.61	\$ 137.61
MSS UNITS	1	40-00000527	Filter, AC, HOFFMAN (nVent), 89084988SP	\$ 113.85	\$ 113.85
MSS UNITS	2	40-00000483	SERVICE KIT, FOR F18 FILTER, LIQUID LEVEL INDICATOR	\$ 43.56	\$ 87.12
MSS UNITS	2	40-00000537	SERVICE KIT, F18 FILTER, UPPER BOWL	\$ 48.51	\$ 97.02
MSS UNITS	1	40-00000437	FILTER, 25-40 MICRON, F18, 1-1/2"	\$ 308.88	\$ 308.88
MSS UNITS	1	40-00000082	REGULATOR, AIR PRESSURE, 1-1/4" NPT	\$ 361.35	\$ 361.35
MSS UNITS	1	40-00000130	FAN, BLOWER, FLATPAK, 220mm SQUARE, 230VAC, 47 Watts	\$ 292.05	\$ 292.05
MSS UNITS	1	45-00000488	COMPUTER, QUAD CORE PC, CIRRUS, WINDOWS 10, MSS-MTX3-XEON19-009	\$ 5,786.55	\$ 5,786.55
MSS UNITS	1	45-00000487	PC, PANEL, INDUSTRIAL, TOUCHSCREEN, W/ WINDOWS 10, FX15-MSS-E19-10	\$ 5,791.50	\$ 5,791.50
MSS UNITS	3	45-00000184	PLC, 24VDC, DISCRETE INPUT 8-POINT, DISCRETE OUTPUT 6-POINT	\$ 207.90	\$ 623.70
MSS UNITS	1	40-00000010	MODULE, INPUT, PLC, DISCRETE, 24VDC, 16 POINT	\$ 93.06	\$ 93.06
MSS UNITS	1	40-00000186	MODULE, OUTPUT, PLC, RELAY, 6-240VAC/6-27VDC	\$ 84.15	\$ 84.15
MSS UNITS	1	40-00000262	RELAY SOCKET, QM2 SERIES	\$ 8.94	\$ 8.94
MSS UNITS	1	40-00000254	RELAY, 24V COIL, 2NO	\$ 20.79	\$ 20.79
MSS UNITS	1	40-00000126	RELAY, CONTROL, SAFETY, 24V COIL, 6NO	\$ 443.52	\$ 443.52
MSS UNITS	1	40-00000214	MODULE, INPUT, SSR, 10-32VDC	\$ 29.70	\$ 29.70
MSS UNITS	1	40-00000215	MODULE, OUTPUT, SSR, 0-60VDC	\$ 29.70	\$ 29.70
MSS UNITS	1	40-00000019	DRIVE, 7.5 HP, 460V, 3 PH	\$ 1,197.90	\$ 1,197.90
MSS UNITS	1	40-00000024	CONTACTOR, COIL, 24VDC, 25A, 54mm	\$ 89.10	\$ 89.10
MSS UNITS	1	40-00000258	CONTACTOR, COIL, 24VDC, 9A, 43mm	\$ 42.57	\$ 42.57
MSS UNITS	1	40-00000414	STARTER, MOTOR, MANUAL, ROTARY HANDLE, 1-1.6A, ADJUSTABLE	\$ 106.92	\$ 106.92
MSS UNITS	1	40-00000181	STARTER, MOTOR, MANUAL, ROTARY HANDLE, 11-16A, ADJUSTABLE	\$ 114.84	\$ 114.84
MSS UNITS	1	51-00000004	PCB ASSY, 985-2 AND 995-1, INTERFACE MVDS RECEIVER AND PC	\$ 4,801.50	\$ 4,801.50
MSS UNITS	1	51-00000006	PCB ASSY, 992-2 AND 995-1, DSP SPECTROMETER CONTROLLER	\$ 4,515.50	\$ 4,515.50
MSS UNITS	1	50-00000025	PCB, 181-2, CIRRUS SOL DRIVER	\$ 1,331.00	\$ 1,331.00



MSS UNITS	1	40-00000251	POWER SUPPLY, 24VDC, 180W, 7.5A	\$ 321.75	\$ 321.75
MSS UNITS	1	40-00000256	POWER SUPPLY, 48VDC, 90-264 VAC, 2000W	\$ 975.15	\$ 975.15
MSS UNITS	1	40-00000274	POWER SUPPLY, LINEAR, 5VDC, 9A, SOLA	\$ 391.05	\$ 391.05
MSS UNITS	1	40-00000065	POWER SUPPLY, LINEAR, DUAL, +/-15VDC, 3A	\$ 400.95	\$ 400.95
MSS UNITS	1	40-00000222	POWER SUPPLY, LINEAR, TRIPLE, 5V, 2A, +/-15V, .4A	\$ 257.40	\$ 257.40
MSS UNITS	1	40-00000252	POWER SUPPLY, 24VDC, 600W, 25A	\$ 714.78	\$ 714.78
MSS UNITS	15	40-00000245	VALVE, SOLENOID, PNEUMATIC, 24 VDC	\$ 73.26	\$ 1,098.90
MSS UNITS	1	40-00000064	POWER SUPPLY, LINEAR, 5VDC, 3A	\$ 163.35	\$ 163.35
MSS UNITS	5	40-00000180	TILE, CERAMIC, WHITE ALUMINA, 0.04" THK. x 4.5" x 6.5" MATERIAL WAS CERAMTEC R-708S 96%ALUMINA 3/4/2021 NEW MATERIAL COORSTEK ADS-96R 96% ALUMINA	\$ 7.92	\$ 39.60
MSS UNITS	1	40-00000509	DRIVE, 10 HP, 460V, 3 PH	\$ 1,395.90	\$ 1,395.90
MSS UNITS	1	40-00000296	STARTER, MOTOR, MANUAL, ROTARY HANDLE, 1.6-2.5A, ADJUSTABLE	\$ 106.92	\$ 106.92
MSS UNITS	1	40-00000413	STARTER, MOTOR, MANUAL, ROTARY HANDLE, 4-6.3A, ADJUSTABLE	\$ 106.92	\$ 106.92
MSS UNITS	1	40-00000297	STARTER, MOTOR, MANUAL, ROTARY HANDLE, 6.3-10A, ADJUSTABLE	\$ 114.84	\$ 114.84
MSS UNITS	1	40-00000328	POWER SUPPLY, 24VDC, 180-264 VAC, 1920W	\$ 975.15	\$ 975.15
MSS UNITS	5	40-00000308	VALVE, SOLENOID, PNEUMATIC, MAC 52, 24 VDC, W/LEAD	\$ 129.69	\$ 648.45
3,4,6,7,9,10,10A,12,14,15,16,18,19,20, 2,23,24,25,25A,26,27,29,30A,31,32,34,3 5,36A,37,39,39A,40,41,42,44,46,47,51	10	5-440038	BEARING VPS-335 PILLOW BL 2-3/16"	\$ 135.80	\$ 1,358.00
4,7,10,25,29,31,35,59	1	5-563487	HEAD PULLEY 12" DIA W-54.25 FROM CENTER	\$ 1,753.77	\$ 1,753.77
4,7	1	5-573231	GEARMOTOR, SK 9032.1 AZ 132MH/4	\$ 3,002.64	\$ 3,002.64
4,6,7,9,10,10A,12,14,15,16,18,19,20,22 23,24,25,25A,26,27,29,30A,31,32,34,35, 36A,37,39,39A,40,41,42,44,46,47,51,5	5	5-040314	BEARING VF4S-335	\$ 130.32	\$ 651.60
5	2	5-053521	CHAIN ROLLER 80 PITCH X 60 PITCHES (MASTER LINK INCLUDED)	\$ 103.95	\$ 207.90
5	1	3-9053593	ASSY, AUGER ROTOR HS18.25OD x 80D TUBE x 120L	\$ 6,673.28	\$ 6,673.28
5,8	1	5-053696	CHAIN ROLLER 80 PITCH X 76 PITCHES (MASTER LINK INCLUDED)	\$ 154.28	\$ 154.28
5,8	5	5-052016	BEARING SFC-22C 1-3/8 SHAFT	\$ 160.81	\$ 804.05
5	2	3-9053235	ASSY, SPROCKET, AUGER ROTOR	\$ 2,980.00	\$ 5,960.00
5	1	5-573350	Gearmotor SK 9032.1AXB - 132SP4, 7.5HP, 10.73:1	\$ 2,894.31	\$ 2,894.31
5,8	1	5-053694	SPROCKET, ROLLER CHAIN 80BS20 1 3/4	\$ 98.92	\$ 98.92
6,9,12,14,24,25A,34,37,39,44,51,57,60	1	5-563545	GEARMOTOR SK 9022.1 AZ 100LH/4 58 RPM, 460 V, 60 Hz, M1-2-IV, 3 HP	\$ 2,116.42	\$ 2,116.42
8	1	3-9053590	ASSY, 3L ROTOR, OD27.4_LH_20_PITCH_120W_0 DEG	\$ 6,021.74	\$ 6,021.74
8	1	3-9053591	ASSY, 3L ROTOR, OD27.4_LH_20_PITCH_120W_60 DEG	\$ 6,021.74	\$ 6,021.74



8	1	5-053398	CHAIN ROLLER 80 PITCH X 88 PITCHES (MASTER LINK INCLUDED)	\$ 143.22	\$ 143.22
8	2	3-9053323	ASSY, SPROCKET, AUGER ROTOR, 36T	\$ 2,980.00	\$ 5,960.00
8	1	5-573118	Gearmotor SK 9032.1AXB - 132SP4, 7.5HP, 10.73:1	\$ 2,729.55	\$ 2,729.55
10,25,31	1	5-563531	SK9032.1 AZ 132MH/4 RATIO 29.66:1 10 HP RPM 1770 230/460 60 HZ. INVERTER DUTY OUTPUT 58 OUTPUT BORE 2.00 M1-2-IV	\$ 2,910.99	\$ 2,910.99
10A,20,26,27,30A,32,36A,39A,40,41,42, 46,53,56	1	5-563543	GEARMOTOR SK 9022.1 AZ 112MH/4, OUTPUT 59 RPM, 460 V, 60 Hz, M1-2-IV, 5 HP RPM 1770 INVERTER DUTY RATIO 29.20:1 OUTPUT BORE 1.5	\$ 2,118.62	\$ 2,118.62
11A,15,16,18,19,22,23,51A,53A,55,60A	1	5-563547	GEARMOTOR SK 9022.1 AZ 90LH/4	\$ 1,798.49	\$ 1,798.49
13,17,33	2	5-052193	POLY CHAIN PULLEY 8MX-72S-36 (3020)	\$ 168.84	\$ 337.68
13,17,33	2	5-046860	BUSHING #3020 BORE 2.1875 SINTERED STEEL	\$ 52.68	\$ 105.36
13,17,33	5	5-051643	TIMING BELT 8MM X 36MM X 1040MM	\$ 139.32	\$ 696.60
13,17	1	4-9026081	Key, 1/2 x 1-5/8	\$ 54.63	\$ 54.63
13,17	1	5-563063	GEARMOTOR, SK9032.1VXF-132SH/4 B 7.5 HP RPM 1780 230/460V 60HZ. SHAFT ASSY AT"B" OUTPUT 205 RPM M4-VERTICAL-TB4-CE-IV RATIO 8.48	\$ 2,878.37	\$ 2,878.37
13,17,33	1	3-9026079	Assy, Coupling Rotex 42, 2 x 1-3/4	\$ 418.26	\$ 418.26
13,17,21,33	5	5-562498	BEARING, CUSTOM FLANGE, 4 BOLT, 2 3/16" BORE	\$ 152.48	\$ 762.40
13,17,33	2	3-9035401	WELD, SPINDLE, DRIVEN	\$ 400.00	\$ 800.00
13,17,33	1	3-9026074	WELD, SPINDLE, DRIVE	\$ 450.00	\$ 450.00
28A	1	5-850740	BELT, CONV, 112" X 497" PVC HDIR BLACK .138 THICK RECESSED FLEXCO STAINLESS LACING RS62 (19' PULLEY CENTERS)	\$ 7,813.26	\$ 7,813.26
28A	1	5-573359	GEARMOTOR, SK 93772.1AH-132MP/4 CUS TW (10HP, 246RPM, 55H7)	\$ 2,355.10	\$ 2,355.10
28A,50A	1	5-850901	PULLEY, TAIL DRIVEN, 16.75" DIA, 55H7 (112" in Belt)	\$ 8,723.75	\$ 8,723.75
28A	1	5-850279	PULLEY, HEAD, FIBERMAX, 8.75" DIA (112" IN BELT)	\$ 6,235.25	\$ 6,235.25
28A,50A	1	5-850006	PULLEY, RETURN, ACCELERATOR CVYR, 6.00 DIA (112" in Belt)	\$ 2,423.75	\$ 2,423.75
28A,50A	2	5-053168	BEARING PBE920X, 2-15/16 BORE DIA, TWO-BOLT BASE, SOLID PILLOW BLOCK BROWNING	\$ 1,016.44	\$ 2,032.88
28A	2	5-500369K	BEARING F4BSCM215 DODGE 2 15/16 FL	\$ 176.52	\$ 353.04
28A,43A	4	5-053670	BEARING, FLANGE MOUNT 4 BOLT 2.4375 BORE	\$ 235.74	\$ 942.96
28A,50A	1	5-573053	BRACKET, TORQUE ARM	\$ 145.25	\$ 145.25
29,35,47,52,58,59	1	5-563828	SK 9032.1 AZ 132SH/4, 58 RPM, 460 V, 60 Hz, M1-2-IV, 7.5 HP OUTPUT BORE 2.00 INVERTER DUTY RATIO 29.66	\$ 2,814.90	\$ 2,814.90
43A,50A	1	5-573326	GEARMOTOR, SK 93772.1A-132SP/4 CUS TW (7.5HP, 115 RPM, 55H7)	\$ 2,208.28	\$ 2,208.28
43A	1	5-860634	PULLEY, HEAD, PLASTICMAX, TAIL DRIVEN, 5.75 DIA (96 in Belt)	\$ 6,448.75	\$ 6,448.75



43A	1	5-850004	PULLEY, RETURN, ACCELERATOR CVYR, 6.00 DIA (96" in Belt)	\$ 2,913.75	\$ 2,913.75
43A	1	5-851043	PULLEY, TAIL DRIVEN, 16.75" DIA, 55H7 (96 in Belt)	\$ 8,741.25	\$ 8,741.25
43A	1	5-860635	BELT, PLASTICMAX 96" X 492" BLACK URETHANE 2 PLY V-GUIDES WITH FLEXCO STAINLESS LACING (228" PULLEY CENTERS))	\$ 16,952.73	\$ 16,952.73
50A	1	5-860235	PULLEY, HEAD, PLASTICMAX, TAIL DRIVEN, 5.75 DIA (112" in Belt)	\$ 6,361.25	\$ 6,361.25
50A	2	3-553980	ASSY, BRUSH STRIP DIVIDER 4 X 96" LG	\$ 175.38	\$ 350.76
50A	2	3-553983	ASSY, BRUSH STRIP DIVIDER 4 X 60" LG	\$ 119.84	\$ 239.68
50A	2	3-553984	ASSY, BRUSH STRIP DIVIDER 4 X 48" LG	\$ 119.32	\$ 238.64
50A	1	5-860674	BELT, PLASTICMAX 112 X 492 BLACK URETHANE 2 PLY V-GUIDES WITH FLEXCO STAINLESS LACING (228IN PULLEY CENTERS)	\$ 19,383.00	\$ 19,383.00
55A	1	5-573340	BEARING, 216 HANGER 3-7/16" SHAFT, NYLON	\$ 656.04	\$ 656.04
55A	1	5-573339	HANGER, 216 3-7/16" SHAFT, 24" SCREW, NO TOP PLATE	\$ 468.25	\$ 468.25
61,62,63,71,72,73	4	A93HARB	ROLLER BLOCK ASSEMBLY 3HA	\$ 45.12	\$ 180.48
ELECTRICAL PANEL	2	ACS380-040C-05A6-4+K47	ACS380 3 HP, 3PH, 380-480VAC DRIVE IP20 R1	\$ 839.93	\$ 1,679.86
ELECTRICAL PANEL	2	ACS380-040C-09A4-4+K47	ACS380 5 HP, 3PH, 380-480VAC DRIVE IP20 R1	\$ 992.01	\$ 1,984.02
ELECTRICAL PANEL	1	ACS580-01-012A-4	DRIVE 3PH 7.5HP 380-480VAC UL TYPE 1 R1	\$ 1,246.00	\$ 1,246.00
ELECTRICAL PANEL	1	ACS580-01-014A-4	DRIVE 3PH 10HP 380-480VAC UL TYPE 1 R2	\$ 1,303.75	\$ 1,303.75
ELECTRICAL PANEL	1	ACS580-01-023A-4	DRIVE 3PH 15HP 380-480VAC UL TYPE 1 R2	\$ 1,699.25	\$ 1,699.25
ELECTRICAL PANEL	1	ACS580-01-027A-4	DRIVE 3PH 20HP 380-480VAC UL TYPE 1 R3	\$ 2,070.25	\$ 2,070.25
ELECTRICAL PANEL	2	FENA-21-KIT	ETHERNET IP/MODBUS TCP/PROFINET DUALPORT ADAPTER	\$ 317.63	\$ 635.26
ELECTRICAL PANEL	1	3RV2021-1EA10	SIE-Motor Protector Overload SO	\$ 68.13	\$ 68.13
ELECTRICAL PANEL	1	3RV2021-1DA10	SIE-Motor Protector SO 2.2-3.2A	\$ 57.16	\$ 57.16
ELECTRICAL PANEL	1	3RV2021-1FA10	SIE-Motor Protector Overload SO	\$ 57.16	\$ 57.16
ELECTRICAL PANEL	1	3RV2021-1HA10	SIE-Motor Protector Overload SO	\$ 54.43	\$ 54.43
ELECTRICAL PANEL	1	3RV2021-1JA10	SIE-Motor Protector Overload SO	\$ 63.88	\$ 63.88
ELECTRICAL PANEL	1	3RV2021-1KA10	SIE-Motor Protector Overload SO	\$ 63.88	\$ 63.88
ELECTRICAL PANEL	1	3RV2021-4AA10	SIE-Motor Protector Overload SO/11-16A	\$ 66.57	\$ 66.57
ELECTRICAL PANEL	1	3RV2021-4BA10	SIE-Motor Protector Overload SO	\$ 63.40	\$ 63.40
ELECTRICAL PANEL	1	3RV2021-4DA10	SIE-Motor Protector Overload SO/20-25A	\$ 77.23	\$ 77.23
ELECTRICAL PANEL	2	3RT2026-1BB40	CONTACTOR SO 25A 24VDC 1NO/1NC SCRWB	\$ 81.38	\$ 162.76
ELECTRICAL PANEL	2	3RT2036-1NB30	CONTACTOR, AC3:22KW/400V, 1NO+1NC, 20-33V AC/DC WITH VARISTOR, 3-POLE, SIZE S2, SCREW TERMINAL	\$ 134.21	\$ 268.42
ELECTRICAL PANEL	2	6ES7155-6AU01-0CN0	SIMATIC ET 200SP, PROFINET 2- PORT INTERFACE MODULE	\$ 521.97	\$ 1,043.94



ELECTRICAL PANEL	2	6ES7193-6AR00-0AA0	SIMATIC ET 200SP, BUSADAPTER BA 2XRJ45 SOCKETS FOR PROFINET	\$ 94.38	\$ 188.76
ELECTRICAL PANEL	2	6ES7131-6BF00-0CA0	SIMATIC ET 200SP, DI 8X24VDC HF	\$ 98.26	\$ 196.52
ELECTRICAL PANEL	2	6ES7134-6HB00-0CA1	SIMATIC ET 200SP, AI 2X U/I 2- 4- WIRE	\$ 384.27	\$ 768.54
ELECTRICAL PANEL	2	6ES7136-6BA00-0CA0	SIMATIC ET 200SP, 8 FDI 24VDC	\$ 369.67	\$ 739.34
ELECTRICAL PANEL	2	6ES7136-6DB00-0CA0	SIMATIC ET 200SP, 8 FDO 24VDC 2A	\$ 428.05	\$ 856.10
ELECTRICAL PANEL	2	6ES7136-6RA00-0BF0	SIMATIC ET 200SP, 1 FRO 24VDC 230VAC 5A	\$ 187.76	\$ 375.52
ELECTRICAL PANEL	2	6ES7132-6BD20-0CA0	SIMATIC ET 200SP, DO 4X24VDC 2A HF	\$ 136.20	\$ 272.40
ELECTRICAL PANEL	2	6ES7132-6HD01-0BB1	SIMATIC ET 200SP, RQ NO 4X 120VDC 230VAC/5A	\$ 115.76	\$ 231.52
ELECTRICAL PANEL	1	6ES7193-6BP00-0DA0	SIMATIC ET 200SP,BASE UNIT BU15- P16+A0+2D NEW LOAD GROUP	\$ 46.38	\$ 46.38
ELECTRICAL PANEL	1	6ES7193-6BP20-0BB0	SIMATIC ET 200SP,BASE UNIT BU20- P12+A4+0B W/4 AUX TERM, BRIDGED TO THE LEFT	\$ 37.10	\$ 37.10
ELECTRICAL PANEL	1	6ES7193-6BP20-0BF0	SIMATIC ET 200SP, BASEUNIT TYPE F0 BU20-P8+A4+0B	\$ 37.10	\$ 37.10
ELECTRICAL PANEL	1	6ES7193-6BP00-0BA0	BASE UNIT TYPE A0, BU15- P16+A0+2B	\$ 27.83	\$ 27.83
ELECTRICAL PANEL	2	6EP3437-8SB00-0AY0	SIE-Power supply 40A/24VDC/3PH	\$ 631.03	\$ 1,262.06
ELECTRICAL PANEL	2	6EP1961-2BA21	SIE-Selectivity module, 4x10A/24VDC	\$ 184.80	\$ 369.60
ELECTRICAL PANEL	2	KLM-30	FUSE KLM-30	\$ 11.55	\$ 23.10
ELECTRICAL PANEL	1	LNx-500A	ETHERNET SWITCH 5-PORT 10/100TX SLIM INDUSTRIAL	\$ 103.25	\$ 103.25
ELECTRICAL PANEL	1	LNx-800A	SWITCH, 8-PORT INDUSTRIAL UNMANAGED	\$ 176.75	\$ 176.75
ELECTRICAL PANEL	1	LNP-201AG-T	Industrial IEEE 802.3at Gigabit PoE Injector, EOT (-40°C ~ 75°C)	\$ 290.50	\$ 290.50
ELECTRICAL PANEL	2	PS30-SS	P/S-30A DISCONNECT SWITCH	\$ 236.92	\$ 473.84
ELECTRICAL PANEL	2	PS60-SS	P/S-60A DISCONNECT SWITCH	\$ 287.54	\$ 575.08
ELECTRICAL PANEL	2	800T-NX1560	A/B-E-Stop Assembly	\$ 191.94	\$ 383.88
ELECTRICAL PANEL	1	LTF24IC2LDQ	LASER SENSOR 24'	\$ 838.23	\$ 838.23
ELECTRICAL PANEL	1	MQDEC2-530	LASER SENSOR CABLE 30 FT	\$ 48.13	\$ 48.13

TOTAL \$214,477.54
\$26,073.25
\$240,550.79

Eddy Current

PRICES SUBJECT TO CHANGE

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Metro Waste Authority Board
Monthly Board Meeting
October 20, 2021
Agenda Item 10

ITEM:

Approval of Change Order for Material Recovery Facility (MRF) Education Center

SUMMARY:

The Metro Waste Authority Board voted to enter a Build Agreement with Split Rock Studios for the exhibits in the MRF Education Center. Through assessment of the proposed design, staff requested enhanced interactivity of the exhibits to appeal to broader learning styles, which resulted in a change order to the agreement totaling \$38,478.

DISCUSSION POINTS:

The requested enhancements to the exhibits include:

- Three-dimensional additions and textural elements to large free-standing kiosk
- Interactive capability for the recycling truck, including sounds, lights, levers, and a standing platform
- Increased immediate accuracy feedback for the sorting conveyor belt
- Second bin with storage space for RFID pucks for the sorting conveyor belt
- Additional mobile kiosk with vitrine for rotational, seasonal, or event-specific displays

STAFF RECOMMENDATION:

Staff recommends approval of the Change Order of \$38,478 with Split Rock Studios to finalize exhibit design for a total project cost of \$306,033.

BUDGET REQUIREMENTS:

The Education Center at the MRF is a budgeted project in the FY21/22 Capital Expense Fund, with funds available to cover the total cost of the Build Agreement including this Change Order.

ATTACHMENTS:

Split Rock Change Order

CONTACT:

Sarah Borzo, education & outreach coordinator, 515.323.6507



Change Order Request (COR#1)

Re: Increased Budget DDII

Split Rock Studios proposes to furnish the following:

- 1 **Increased Budget**
Original Budget-\$267,555
New Budget-\$306,033
COR#1-\$38,478

Price Summary

1	Increased Budget		\$38,478
		Total Price	\$38,478

Acceptance

Split Rock Studios

Acceptance:

Isaiah Boehlert - Operations Manager

Metro Waste Authority

Date -

Date

Metro Waste Authority Board

Monthly Board Meeting

October 20, 2021

Agenda Item 11

ITEM:

Approval to Reject Phase 1 Closed Stormwater Repair Bids at Metro Park East Landfill (MPE)

SUMMARY:

Phase I of Metro Park East Landfill has been capped and closed. One of the first capping projects diverted stormwater through two 36-inch culverts. This project was completed approximately 30 years ago. Staff noticed increased leachate collection from the area in the spring of 2021. Staff had the culverts inspected by video this summer and determined the culverts were no longer functioning properly.

The landfill has experienced significant settlement, and these culverts have been compromised. The culverts were placed near the waste material. Stormwater now appears to be entering the landfill leachate collection system. HDR prepared specifications to remove these culverts and divert the stormwater on the surface of the facility. Bids were solicited and received on October 14th.

The following bids were received:

1.Ryan Incorporated	\$1,967,900.00
2.JB Holland Construction, Inc	\$1,722,600.00
3.Veit Specialty Contracting	\$1,685,200.00
4.RachelContracting	\$1,279,500.00

DISCUSSION POINTS:

The bids were substantially higher than the Engineers Estimate. MWA can place some temporary structures to prevent spring run-off from entering the landfill leachate collections system. A Cell construction project is scheduled for MPE next spring. The Phase I Closed Area Stormwater Repair project can be bid as part of the spring cell construction project. This should allow for more competitive bids.

STAFF RECOMMENDATION:

Staff recommends that the Board reject all bids and solicit bids as part of the Cell E construction project next spring.

BUDGET REQUIREMENTS:

MWA has \$12,000,000 budgeted for the Cell E construction project. The borrow material that will be used for the repair will be removed from the Cell E construction. The utilization of this borrow material should result in cost savings on the Cell E construction project. Additionally, the two projects should eliminate the cost associated with two mobilizations.

ATTACHMENTS:

HDR Bid Summary

CONTACT:

Jon Penheiter, solid waste administrator, 515.333.4446



October 14, 2021

Mr. Jon Penheiter
Solid Waste Administrator
Metro Waste Authority
12181 NE University Avenue
Mitchellville, IA 50169

RE: Bid Review and Evaluation
MWA MPE Phase 1 – 2021 Drainage and Cover Improvements

Dear Mr. Penheiter:

At MWA's request, HDR Engineering, Inc. (HDR) has completed a technical review and evaluation of the Bid Forms for MWA Project Metro Park East (MPE) Phase 1 – 2021 Drainage and Cover Improvements furnished to HDR on October 14, 2021. There were four (4) bids received, with total base bid prices ranging from \$1,259,500.00 to \$1,967,900.00. Based on the alternate bid item of Bid Item 105 (dormant seeding in lieu of seeding in the Spring of 2021), the alternate total bid prices ranged from \$1,279,500.00 to \$1,967,900.00 (base bid plus alternate bid item no. 105). The engineer's opinion of probable construction cost (OPCC) of the base bid was \$634,000.00 which is \$625,500.00 or 49.7 percent lower than the low base bid. Both the lowest total base bid and lowest total bid including the alternate, were submitted by Rachel Contracting (Rachel).

HDR has reviewed the price calculations and summaries on the Bid Forms from all Bidders and found one irregularity in pricing. JB Holland calculated the allowance bid item – Item 104 and the total base bid amount incorrectly. The allowance and base bid amounts are corrected within the attached bid tabulation. The firms submitting bids included many of the firms who HDR would typically expect to bid on an earthwork/civil landfill project in this region. Each bidder acknowledged receipt of the one (1) addendum.

Due to the result of the received bids being substantially higher than the engineer's OPCC, HDR recommends MWA re-bids the project in the Spring with a longer project duration in order to achieve reduced pricing. It is assumed that bid prices were high compared to the OPCC due to the tight schedule and ability to secure construction materials and equipment. It is recommended that if the project is re-bid in the Spring, temporary measures be implemented as soon as possible to protect the project area from potential erosion.

Please do not hesitate to contact me at (402) 208-0662 if you require additional clarification or information.

Sincerely,
HDR Engineering, Inc.

Austin Broshar
Project Manager

Attachments: Bid Tabulation

Bid Tabulation - MWA MPE Phase 1 - 2021 Drainage and Cover Improvements

Item No.	Bid Items	Estimated Quantity	Unit	Ryan Incorporated Central		JB Holland		Veit		Rachel Contracting	
				Bid Unit Price	Bid Price	Bid Unit Price	Bid Price	Bid Unit Price	Bid Price	Bid Unit Price	Bid Price
101	Mobilization, demobilization, and all work not included in Bid Item Nos. 102, 103, and 104.	1	LS	\$ 413,000.00	\$ 413,000.00	\$ 465,000.00	\$ 465,000.00	\$ 401,000.00	\$ 401,000.00	\$ 205,000.00	\$ 205,000.00
102	Site Preparation and Earthwork	1	LS	\$ 410,000.00	\$ 410,000.00	\$ 821,000.00	\$ 821,000.00	\$ 789,000.00	\$ 789,000.00	\$ 480,000.00	\$ 480,000.00
103	Culvert Removal and Drainage Improvements	1	LS	\$ 966,000.00	\$ 966,000.00	\$ 295,000.00	\$ 295,000.00	\$ 342,000.00	\$ 342,000.00	\$ 460,000.00	\$ 460,000.00
104	Project Allowance (10% of Base Bid = Item No.'s 101+102+103).	1	LS	\$ 178,900.00	\$ 178,900.00	\$ 158,100.00	\$ 158,100.00	\$ 153,200.00	\$ 153,200.00	\$ 114,500.00	\$ 114,500.00
105	Alternate Item - Dormant Seeding	1	LS	\$ -	\$ -	\$ 15,000.00	\$ 15,000.00	\$ -	\$ -	\$ 20,000.00	\$ 20,000.00
Total Base Bid				\$ 1,967,900.00		\$ 1,739,100.00		\$ 1,685,200.00		\$ 1,259,500.00	
Total Alternate Bid (Base Bid + Alternate Bid Item No. 105)				\$ 1,967,900.00		\$ 1,754,100.00		\$ 1,685,200.00		\$ 1,279,500.00	

Metro Waste Authority Board
Monthly Board Meeting
October 20, 2021
Agenda Item 12

ITEM:

Approval of Contract SloanVazquezMcAfee Municipal Solid Waste Advisors

SUMMARY:

Metro Waste Authority has established a relationship with SloanVazquezMcAfee during the design and construction phase of the Metro Recovery Facility (MRF). A scope of work was developed, along with two agreements to contract with the firm to conduct the commissioning and the initial management and training associated with the facility.

DISCUSSION POINTS:

The scope of work associated with the MRF Commissioning and Performance Testing (Task 1) results in the following deliverables:

- Physical equipment inspection
- Dry-run commissioning
- Wet-run commissioning
- Performance testing

This scope of work is estimated to take 13-15 days and cost \$32,500-\$37,500.

The scope of work associated with the MRF management and training (Task 2) results in the following contracted work:

- Implement best management practices
- Mechanical adjustments
- Maximizing recover
- Develop operating manual

This scope of work is estimated to take 60 days and cost \$70,000.

STAFF RECOMMENDATION:

Staff recommends approval of the two contracts (Task 1 & 2) with SloanVazquezMcAfee, totaling \$102,500 - \$107,500.

BUDGET REQUIREMENTS:

Up to \$107,500 in contracted services can be paid for by budgeted dollars associated with professional services. However, \$40,000 in budgeted, unpaid salary expenses associated with the MRF Manager position can be allocated toward Task 2, as this contracted work would otherwise be performed by this position.

ATTACHMENTS:

Proposal for scope of work, outlining details for Task 1 and Task 2 with potential to engage in an additional contract for Task 3. Contracts associated with Task 1 and Task 2 are also included.

CONTACT:

Michael McCoy, executive director, 515.323.6535

Proposal to Perform MRF Testing & MRF Production Systems Training

MRF Commissioning and Performance Testing

Development, Training and Implementation of Lean-Centric
Management and Production Systems

On-Call MRF Management Service

Presented to:

**Metro Waste Authority
Des Moines, Iowa**

Presented by:

*Sloan***VAZQUEZ****McAFEE**
MUNICIPAL SOLID WASTE ADVISORS

P.O. Box 15623, Irvine, CA 92623

Office: 714-348-6350

info@sloanvazquez.com · www.sloanvazquez.com

September 30, 2021

September 30, 2021

Michael McCoy
Executive Director
Metro Waste Authority

Des Moines, IA

Re: Proposal to Provide MRF System Testing and Training Services

Dear Mr. McCoy

In 2019, Sloan Vazquez McAfee's (SVM) assisted ISG, in association with Christensen Development, in the preparation of Metro Waste Authority's (MWA) Request for Proposals (RFP) for the design, manufacture, and installation of a new recycling processing system that will meet the MWA's long-term recycling processing needs. An important aspect of SVM's contribution to the MRF system procurement was the development of the MRF system performance requirements, mechanical commissioning protocol, and the metrics for measuring processing system performance and acceptance. SVM performance and acceptance protocols were incorporated into the District's Purchase Agreement with CP Manufacturing.

Now, SVM proposes to perform MRF Commissioning and Performance Testing, and MRF Management Training for MWA's new Recycling Processing System, as follows:

A. TASK 1 - MRF COMMISSIONING AND PERFORMANCE TESTING

SVM's MRF operations experience is derived from years of direct, bottom-line responsibility for managing municipal solid waste and recycling operations and facilities. We offer our extensive knowledge of industry best practices and demonstrated results in all aspects of solid waste management and materials processing. The following is a description of the firm's approach to material processing system commissioning and performance testing:

SVM undertakes a four-phase approach to system commissioning, including a physical equipment inspection, a dry-run commissioning of the system without material input, wet-commissioning with material input, and performance and acceptance testing. The following is a condensed description of the four phases:

A.1 Phase One: Physical Equipment Inspection (2-person crew, 3-days)

Phase one includes a physical inspection of each piece of equipment that is listed on the Purchase Agreement to confirm inclusion of all purchased equipment, its proper installation and functionality.

Step One: Equipment verification and proper installation confirmation

Equipment includes:

- | | |
|---------------------|----------------------------------|
| 1. Conveyors | 2. Screens |
| a. Beds | 3. Wind Sifters |
| b. Pulleys | 4. Optical Sorting Units |
| c. Rollers | 5. Magnets |
| d. Chain assemblies | 6. Eddy Current Separators |
| e. Rails | 7. Motor Control System Function |

Step Two: Confirm component functionality by independently testing each component

A.2 Phase Two: Dry-Run Commissioning (2-person crew, 2-days)

During this phase of the process, the system is started in “Auto” mode and the plant is continuously operated, without the input of material, for a specified number of hours, which is typically between four-to-seven hours without interruption.

A.3 Phase Three: Wet Commissioning (2-person crew, 3 to 5 days)

During this final phase of commissioning, the system is operated with material. Unlike performance testing, which is described below, wet commissioning is conducted without regard for hourly production or product quality. This process is used to confirm system availability (up-time), which is usually six-to-seven hours per shift for between 3-to-5 consecutive shifts.

A.4 Phase Four: Processing System Performance Testing (2-person crew, 5 days)

The purpose of this testing is to measure the performance of the system, including hourly production rates as well as the quality of the resulting product. This testing is usually performed four-to-six weeks after the completion of Phase Three Commissioning, and typically requires one-to-two weeks for completion. The performance testing process includes the following analysis:

- Test for system availability (e.g. 90% of scheduled shift time)
- Test for hourly production (throughput in tons per hour)
- Test for product quality (e.g. percent outthrows, percent contaminants, etc.)
- Test for targeted commodities that remain in process residue

B. TASK 2 - MRF MANAGEMENT AND MANAGEMENT TRAINING

SVM’s MRF management objective is the creation of an environment where personnel work cross-functionally and key managers and supervisors are equipped with the technical knowledge and leadership skills necessary to gain respect among peers and voluntarily accept accountability for the achievement of operational goals.

A primary task is the implementation of an integrated production system to manage the business. Standards, measurements, tracking, feedback loops and well-defined accountability (ownership) will be created. The *process* of ownership is central to success. Collaboration in a structure with accountability dispersed throughout the operation is critical to the developing and sustaining efficient operations.

The SVM production system is Lean-centric and has five primary supporting components:

1. Standard workstations and related standard work,
2. Standard Leader work,
3. Production communication,
4. Team development/training (two-deep bench strength), and
5. Continuous improvement.

The training weaves these five components into an integrated production system.

Objectives

Results to be achieved include the following:

- Develop management skills essential to achieving the full production capabilities of the MRF system.
- Clearly define staff accountability at the individual job level.
- Clearly define flow of communication to ensure that personnel operate within the “matrix” appropriately.
- Develop skills necessary to effectively identify and mitigate obstacles presented by processes and procedures.

Methodology

Approaches to achieve the objectives include the following:

- On-site, one-on-one training for managers, supervisors, machinery operators, mechanics, and general labor in the skills and behaviors required by the management/operation structure.
- On-site, email correspondence, and telephonic support for MRF operations management.
- Individual and group observation and feedback, with recommendations on how to identify current level of productivity and improve the process.
- Develop all training processes, protocols, written communications and meetings to maximize ownership and accountability and accomplish production goals.
- Create direct accountability by monitoring production standards (metrics) and implementing an incentive/disincentive reward system.

Measure of Success

Success is achieved when the new MRF systems are not merely operating, but are operating the way they were designed and manufactured to operate, and meeting or exceeding the designed rates of production and product quality.

Deliverables

SVM will perform the MRF system commissioning and performance testing, as described, and prepare a report describing the results.

SVM will apply management systems and training, as follow:

- B.1 Implementation of Best Management Practices (Lean-centric) for MRF operations (1-person rotation, 40-days)

- Production (plant throughput) requirements – constantly measured
- Output (commodity quality) requirements – constantly characterized
- Staffing Plan – Maximize Per Employee Hourly Recovery
- Sorter labor productivity requirement – constantly measured
- Equipment maintenance – Scheduled and logged with accountability
- Safety, Safety, Safety – Mechanical systems and personal protection and training

B.2 Mechanical adjustment, or modification, as needed (1-person rotation, 5-days)

- Implementation of best-use of equipment
 - Operations plan to accomplish maximum hourly production and product quality
 - Preventative maintenance plan to assure maximum MRF up-time.

B.3 Maximizing recovery from mixed waste (1-person rotation, 5-days)

- Maximize Fiber Recovery
 - Evaluation of MRF residue to establish volume and value of unrecovered fiber
- Targeted Container Recovery
 - Focus upon high-value plastics and metals
 - Mixed-plastic recovery should be secondary, if-at-all.
- Increase “fines” Production
 - Improve quality/marketability of “fines”

B.4 Development of MRF Operations Manual (1-person rotation, 20-days)

- Description of MRF technology and definition of expected outputs
- Establish MRF performance metrics, e.g.
 - Plant up-time (system availability on-demand)
 - Preventative maintenance costs
 - Housekeeping costs
 - Total System operating cost
 - Per-ton, per-hour
 - Commodity quality
 - Commodity production
 - Commodity sales revenue
 - Staffing turnover
- Staffing Plan
 - Job Descriptions
 - Supervision
 - Equipment operators
 - Sorters
 - Administration
- Safety Plan
 - Mechanical system safety
 - Illness and Injury Prevention Plan
 - Personal protective equipment

- Personnel safety training
- Lock-out/Tag-out, lifting, traffic, equipment familiarity
- Maintenance Plan
 - Parts inventory
 - Preventative maintenance program
 - Wear part replacement schedule
 - Emergency repair plan

C. TASK 3 – POST START-UP MRF MANAGEMENT SERVICES

C.1 Day-to-Day MRF Operations Management Services (1 person, On-Call)

- Daily MRF operations management services

Terms and Conditions

To best implement the proposed system testing and management program, it is important that SVM be accorded operational control of the MRF. If we are to be successful, we must be able to make system adjustments and staffing placement decisions, in-the-moment, and on a utilitarian basis.

We propose a project schedule generally applied as follows:

Project	Schedule	Activity	Fee
A		MRF System Commissioning & Performance Testing	
A.1	3 Days	Phase 1 – Physical Equipment Commissioning	\$7,500
A.2	2 Days	Phase 2 – Dry-Run System Commissioning	\$5,000
A.3	3 to 5 Days	Phase 3 – Wet System Commissioning	\$7,500-12,500
A.4	5 Days	Phase 4 – Processing System Performance Testing	\$12,500
	13-15 Days	Total	\$32,500 - \$37,500
B		Development, Training and Implementation of Lean-Centric Management and Production Systems	
B.1	40 Days	Implementation of Best Mgmt. Practices for MRF Ops.	\$40,000
B.2	5 Days	Mechanical adjustment, or modification, as needed	\$5,000
B.3	5 Days	Maximizing recovery from mixed recyclables stream	\$5,000
B.4	10 Days	Development of MRF Operations “Playbook”	\$15,000
	60 Days	Total	\$70,000

C	On-Call	Day-to-Day Management of MRF Operation	To Be Determined
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Joe Sloan will lead the project, with assistance from Michael Sloan, Enrique Vazquez, Charissa McAfee, Paul Contreras and other SVM associates, as approved by MWA. SVM personnel will be continuously engaged in the proposed scope of work for the entire term of the project, supported intermittently by additional staff as required for commodity composition sampling.

Fee Proposal

SVM proposes a professional service fee of \$32,500 - \$37,500 to complete the described A: MRF System Commissioning and Performance Testing.

SVM proposes a professional service fee of \$70,000 to complete the described B: Development, Training and Implementation of Lean-Centric Management and Production Systems.

Out-of-Pocket Expenses

SVM will submit expense reimbursement invoices for actual out-of-pocket expenses, supported by receipts. Expenses will be incurred according to the following limitations:

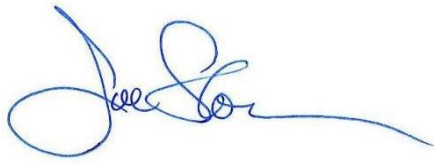
- Airfare - Coach
- Lodging - 3-Star or equivalent
- Auto Rental - Economy
- Mileage - IRS rate
- Per Diem- Meals and incidentals @ \$75/day
- Supplies- As approved in-advance by MWA

Terms

Invoices will be submitted and due, as follows:

- Task One
 - 1/3rd – Task 1 deployment invoice due immediately upon execution of agreement
 - 1/3rd – due immediately upon completion of commissioning Phases 1,2 & 3
 - 1/3rd – due immediately upon satisfactory completion of Phase 4, Performance Testing
- Task Two
 - 1/3rd – Task 2 deployment invoice due upon commencement
 - 1/3rd – due after 25 days in-service
 - 1/3rd – due upon satisfactory completion of Task 2
- Task Three
 - Invoices submitted on a weekly basis, due net-20 days
- Out-of-Pocket Expenses
 - Invoices for MWA-approved expenses will be submitted twice-monthly and due upon receipt.

Thank you for the opportunity to submit our proposal. Sloan Vazquez McAfee hopes to have the opportunity to provide management services for your important project.

A handwritten signature in blue ink, appearing to read "Joe Sloan", with a long horizontal flourish extending to the right.

Joe Sloan, Principal
Sloan Vazquez McAfee

Professional Services Agreement

This Agreement is made and entered into as of 5th day of October 2021, by and between Metro Waste Authority (MWA), Des Moines, IA, hereinafter Client, and Sloan Vazquez McAfee, hereinafter, "Consultant".

RECITALS

This Agreement is entered into with reference to the following facts and circumstances:

- A. That Client desires to engage Consultant to render certain professional service.
- B. That Consultant is qualified to provide such services to Client; and
- C. That Client has elected to engage the services of Consultant upon the terms and conditions as hereinafter set forth.

1. Services

The services to be performed by Consultant under this Agreement shall be the as defined as those described under **TASK A – MRF Commissioning and Performance Testing**, of the **Proposal to Perform MRF Testing & MRF Production Systems Training**, dated October 1, 2021 which is attached herein as Attachment A.

Performance of work specified above is hereby made an obligation of Consultant under this Agreement, subject to any changes that may be made subsequently hereto upon the mutual written agreement of said Parties.

2. Term of Agreement

Said services shall commence upon the execution of this document by MWA and shall continue for completion of tasks defined in **TASK A of Attachment A**, or until such time as either party provides written notice of cancellation. The tasks and services under the Agreement may be changed upon written agreement by both parties. Agreement can be terminated by either party, at any time, without cause. Consultant shall be entitled to compensation in an amount equal to the amount of work completed as per the Scope of Work and Compensation described in Attachment A. Such final compensation shall be due and payable within 3 (three) days of the termination of service.

3. Compensation & Method of Payment

Compensation and Method of Payment under this Agreement shall be as set forth in Attachment A, an amount not-to-exceed \$37,500.00, plus out-of-pocket expenses, as approved by MWA.

4. Authorization and Termination

This Agreement becomes effective upon the date set forth in **Section 2–Term of Agreement** , above.

5. Relationship to Parties

It is understood that the relationship of Consultant to Client is that of an independent contractor and all persons working for or under the direction of Consultant are its agents or employees and not agents or employees of Client.

6. Confidentiality

Consultant agrees that all data, correspondence, information regarding Client operations, and other information regarding the development of the project described herein shall be kept strictly confidential and that Consultant shall at no time convey all or a portion of said data, correspondence or other information to any third party without written consent of Client.

7. Nonassignment

Neither this agreement nor any rights or obligations herein shall be assigned or delegated by the Consultant without the prior written consent of Client.

8. Amendments

This Agreement may be amended or modified only by written agreement signed by both Parties.

9. Validity

The invalidity, in whole or in part, of any provision of this Agreement shall not void or affect the validity of any other provisions of this Agreement.

10. Government Law/Litigation

This Agreement shall be governed by the laws of the State of California and any suit or action initiated by either party shall be brought in the County of Los Angeles, CA. In the event of litigation between the Parties hereto over the terms or performance of this agreement the prevailing party shall be entitled to reasonable attorney's fees and costs.

11. Mediation

Should any dispute arise out of this Agreement, the Parties shall meet in mediation and attempt to reach a resolution with the assistance of a mutually acceptable mediator. Neither Party shall be permitted to file legal action without first meeting in mediation and making a good faith attempt to reach a mediated resolution. The costs of the mediator, if any, shall be paid equally by the Parties. If a mediated settlement is reached, neither Party shall be deemed the prevailing party for purposes of the settlement, and each Party shall bear its own legal costs. Mediation shall occur within 30 days of notice by either party, and if it does not occur within that period of time a legal action shall be permitted to be filed.

12. Entire Agreement

This Agreement, including Attachment A (Letter Proposal), comprises the entire Agreement.

13. Indemnity

Consultant shall defend, indemnify and hold Client and its officers, employees and agents harmless from any and all claims, damages, losses and expenses related to or as a result of intentional or negligent acts for which Consultant or its agents and employees are responsible. Client shall defend, indemnify and hold Consultant and its officers, employees and agents harmless for any and all claims, damages, losses and expenses related to or as a result of intentional or negligent acts for which Client or its agents and employees are responsible.

14. Notice

All notices required by this Agreement shall be given to Client and Consultant in writing, by first class mail, postage prepaid, addressed as follows:

Client:

Metro Waste Authority (MWA)
Michael McCoy, Executive Director
300 East Locust Street, Suite 100
Des Moines, IA 50309
Phone (515) 244-0021

Consultant:

Sloan Vazquez McAfee
Joe Sloan, President
P.O. Box 15623
Irvine, CA 92623
Phone (714) 348-6350

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed on the date first written by their respective officers duly authorized in that behalf.

CLIENT:

DATED: _____, 2021

BY: _____

Michael McCoy, Metro Waste Authority

CONSULTANT:

DATED: October 5, 2021

BY:  _____

Joe Sloan, Sloan Vazquez McAfee

Attachment A Proposal)

Professional Services Agreement

This Agreement is made and entered into as of 14th day of October 2021, by and between Metro Waste Authority (MWA), Des Moines, IA, hereinafter Client, and Sloan Vazquez McAfee, hereinafter, "Consultant".

RECITALS

This Agreement is entered into with reference to the following facts and circumstances:

- A. That Client desires to engage Consultant to render certain professional service.
- B. That Consultant is qualified to provide such services to Client; and
- C. That Client has elected to engage the services of Consultant upon the terms and conditions as hereinafter set forth.

1. Services

The services to be performed by Consultant under this Agreement shall be the as defined as those described under **Task 2 – MRF Management and Management Training**, of the **Proposal to Perform MRF Testing & MRF Production Systems Training**, dated September 30, 2021 which is attached herein as Attachment A.

Performance of work specified above is hereby made an obligation of Consultant under this Agreement, subject to any changes that may be made subsequently hereto upon the mutual written agreement of said Parties.

2. Term of Agreement

Said services shall commence upon the execution of this document by MWA and shall continue for completion of tasks defined in **TASK 2** of **Attachment A**, or until such time as either party provides written notice of cancellation. The tasks and services under the Agreement may be changed upon written agreement by both parties. Agreement can be terminated by either party, at any time, without cause. Consultant shall be entitled to compensation in an amount equal to the amount of work completed as per the Scope of Work and Compensation described in Attachment A. Such final compensation shall be due and payable within 3 (three) days of the termination of service.

3. Compensation & Method of Payment

Compensation and Method of Payment under this Agreement shall be as set forth in Attachment A, an amount not-to-exceed \$70,000.00, plus out-of-pocket expenses, as approved by MWA.

4. Authorization and Termination

This Agreement becomes effective upon the date set forth in Section 2–Term of Agreement , above.

5. Relationship to Parties

It is understood that the relationship of Consultant to Client is that of an independent contractor and all persons working for or under the direction of Consultant are its agents or employees and not agents or employees of Client.

6. Confidentiality

Consultant agrees that all data, correspondence, information regarding Client operations, and other information regarding the development of the project described herein shall be kept strictly confidential and that Consultant shall at no time convey all or a portion of said data, correspondence or other information to any third party without written consent of Client.

7. Nonassignment

Neither this agreement nor any rights or obligations herein shall be assigned or delegated by the Consultant without the prior written consent of Client.

8. Amendments

This Agreement may be amended or modified only by written agreement signed by both Parties.

9. Validity

The invalidity, in whole or in part, of any provision of this Agreement shall not void or affect the validity of any other provisions of this Agreement.

10. Government Law/Litigation

This Agreement shall be governed by the laws of the State of California and any suit or action initiated by either party shall be brought in the County of Los Angeles, CA. In the event of litigation between the Parties hereto over the terms or performance of this agreement the prevailing party shall be entitled to reasonable attorney's fees and costs.

11. Mediation

Should any dispute arise out of this Agreement, the Parties shall meet in mediation and attempt to reach a resolution with the assistance of a mutually acceptable mediator. Neither Party shall be permitted to file legal action without first meeting in mediation and making a good faith attempt to reach a mediated resolution. The costs of the mediator, if any, shall be paid equally by the Parties. If a mediated settlement is reached, neither Party shall be deemed the prevailing party for purposes of the settlement, and each Party shall bear its own legal costs. Mediation shall occur within 30 days of notice by either party, and if it does not occur within that period of time a legal action shall be permitted to be filed.

12. Entire Agreement

This Agreement, including Attachment A (Letter Proposal), comprises the entire Agreement.

13. Indemnity

Consultant shall defend, indemnify and hold Client and its officers, employees and agents harmless from any and all claims, damages, losses and expenses related to or as a result of intentional or negligent acts for which Consultant or its agents and employees are responsible. Client shall defend, indemnify and hold Consultant and its officers, employees and agents harmless for any and all claims, damages, losses and expenses related to or as a result of intentional or negligent acts for which Client or its agents and employees are responsible.

14. Notice

All notices required by this Agreement shall be given to Client and Consultant in writing, by first class mail, postage prepaid, addressed as follows:

Client:

Metro Waste Authority (MWA)
Michael McCoy, Executive Director
300 East Locust Street, Suite 100
Des Moines, IA 50309
Phone (515) 244-0021

Consultant:

Sloan Vazquez McAfee
Joe Sloan, President
P.O. Box 15623
Irvine, CA 92623
Phone (714) 348-6350

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed on the date first written by their respective officers duly authorized in that behalf.

CLIENT:

DATED: _____, 2021

BY: _____

Michael McCoy, Metro Waste Authority

CONSULTANT:

DATED: October 14, 2021

BY:  _____

Joe Sloan, Sloan Vazquez McAfee

Attachment A Proposal)

Metro Waste Authority Board
Monthly Board Meeting
October 20, 2021
AGENDA ITEM 13

ITEM:

Public Hearing to Approve Public Improvement at Central Office

Approval of Public Improvement at Central Office

SUMMARY:

Notice of a public hearing has been published on proposed bid packages for the installation of Solar Panels.

DISCUSSION POINTS:

Bid documents for the Solar Panels will be released tomorrow, October 21, 2021. MWA seeks bids from qualified and experienced contractors for designing, engineering, building, maintaining, and installing a rooftop ballasted solar photovoltaic (PV) project.

STAFF RECOMMENDATION:

Staff recommends approval of the Public Improvement.

BUDGET REQUIREMENTS:

Estimated project cost is \$253,000. DNR awarded MWA a grant for \$112,136, and MWA is responsible for \$140,864. Funds are available in FY21/22 Capital Expenses budget.

ATTACHMENTS:

Notice of Public Hearing

RFP

Drawing and Specs

CONTACT:

Michael McCoy, executive director, 515.323.6535

Sarah Borzo, education and outreach coordinator, 515.323.6507

Nick Johnson, executive coordinator, 515.323.6519

REQUESTS FOR PROPOSALS
for
Installation of Rooftop Solar System

Issued October 20, 2021

by



300 East Locust Street, Suite 100
Des Moines, IA 50309
(515) 244-0021

Proposal Deadline: 4:00 p.m. CST, November 9, 2021

Table of Contents

- I. PROJECT OVERVIEW**
- II. PURPOSE OF RFP**
- III. PROJECT DETAILS**
- IV. SCOPE OF WORK**
- V. SCHEDULE**
- VI. PROPOSAL REQUIREMENTS**
- VII. PROPOSAL EVALUATION**
- VIII. METRO WASTE AUTHORITY CONTACT PERSON**

Attachment 1 – Aerial of Rooftop at 300 E Locust Street, Des Moines, 50309

Attachment 2 – Draft Contract

Attachment 3 – Utility Statements for 300 E Locust Street, Des Moines, 50309 (12 months)

SECTION I. PROJECT OVERVIEW

Metro Waste Authority is soliciting proposals from qualified solar PV providers to design, engineer, build, and maintain installation of rooftop ballasted solar photovoltaic (PV) project(s) at the site address(es) below. Respondents may bid for either or both of two scenarios: a PPA, or Metro Waste Authority having sole ownership of the system. Respondents shall have demonstrated experience designing, planning, scheduling, permitting, and constructing complete solar PV systems, have knowledge of local utilities net metering and interconnection requirements, provide project financial analysis, and provide system monitoring and maintenance. Proposer is responsible for all permitting and licenses and should include the cost of all permitting in their proposal. Respondents should be familiar with Mid-American Energy Tariffs and interconnection regulations and have established on-site safety standards. Metro Waste Authority reserves the right to modify the scope of the project at any time.

SECTION II. PURPOSE OF RFP

Metro Waste Authority's interest in pursuing solar PV projects reflects the following prioritized goals:

1. Meet Metro Waste Authority's objective of reducing Central Office electric grid consumption by at least 25% and make progress toward the Iowa DNR's Environmental Management System's goal of greenhouse gas reduction;
2. Visibly show MWA's commitment to renewable energy through visible local projects;
3. Reduce grid electricity purchases and electricity costs;
4. Support Iowa solar businesses, jobs, and workforce development;
5. Reduce MWA's impact on the climate by reducing greenhouse gas emissions.

SECTION III. PROJECT DETAILS

Metro Waste Authority is seeking proposals for our Central Office. Metro Waste Authority has the right to refuse the Project bid.

Facility	Address	Type
Central Office (main bid)	300 E Locust St, Des Moines	Rooftop ballasted

Desired Solar PV System Description

Metro Waste Authority is seeking the above rooftop ballasted PV systems. Further detail showing aerial images of the above facilities is provided in Attachment 1.

Interconnect

MWA started interconnect application process with MidAmerican Energy on August 9, 2021, with the following equipment.

- Solar Panels: Silfab SIL-400NU
- Inverter- SolarEdge SE 100KUS
- Optimizers- P860

Project Financing

Metro Waste Authority will finance everything themselves for the entirety of the process and will own the system in full for one bid. The other bid will reflect a PPA (lease buyback) of the system with MWA providing finances to purchase the entirety of the solar panels.

System Ownership

Metro Waste Authority requests an option for a solar PV system to be owned by Metro Waste Authority and an option for a

PPA.

Operation and Maintenance (O&M)

The selected Proposer will provide O&M services for the contract life.

Monitoring

Metro Waste Authority requests a monitoring system for system performance and public education through Metro Waste Authority's website and an educational display monitor at the Material Recovery Facility.

SECTION IV. SCOPE OF WORK

Design Guidelines

The Proposer shall include design documents for all elements of the project, including, but not limited to, structural, architectural, mechanical, and electrical. Proposer should consider the following guidelines when designing the solar PV system.

The Proposer shall develop a design for new PV systems that maximize both system size relative to individual facility demand and cost savings for Metro Waste Authority in terms of cost per Kilowatt-hour (kWh). Electrical service information for array tie-in considerations will be viewable during a formal walkthrough. 12 months of electric statements for the building are provided in Attachment 2.

Code Specifications

The installation and power generation and transmission equipment shall comply with applicable building, mechanical, fire, seismic, structural, and electrical codes. Only products that are listed, tested, identified, or labeled by Underwriters Laboratories (UL) or another nationally recognized testing laboratory shall be used as components in the project. Construction must comply with current adopted City Building Code, which includes: International Building Code, National Electric Code (NEC) and State Fire Marshall.

Warranties

The Proposer must provide their standard system warranty coverage along with specific equipment warranty coverage for modules, inverter, racking and workmanship.

- **Panels:** *Minimum* 25-Year Power Output.
- **Inverter:** *Minimum* 14 -year inverter warranty.
- **Workmanship:** *Minimum* One Year Limited Warranty

Inspection and Commissioning

To ensure compliance with all electrical codes, an inspection by a licensed electrical inspector is mandatory after construction is complete as well as by the State electrical inspector. Because conduit will require the puncture of the roof surface, roof will need to remain watertight after installation. Commissioning tests shall be included in the final inspection and QCP.

System Monitoring

Monitoring of system performance (separate from utility meter monitoring requirements) and providing public education are two important elements of this RFP. Metro Waste Authority will favor a proposal that includes a monitoring system that can be used to monitor system performance, as well as Metro Waste Authority's website for public viewing. Data storage, management, and display will be the responsibility of the Proposer. In addition, the selected vendor must design and install one on-site kiosk (monitor viewing station) designed specifically for educational purposes at the MRF.

Additionally, the regularly collected data should reflect, but not be limited to, the following:

- Average and accumulated output (kWh/day, kWh/year, and cumulative kWh) versus building load
- Capacity factor

- Air quality emissions averted and real-world equivalents conversion (e.g., homes powered, vehicle miles drive, trees planted, etc.)

Operation and Management of System

The successful respondent will provide O&M of the entire solar electric system over the contract life.

Contract Length

6 Years with buyback with option of buyback with PPA bid.

Final Design Package

The winning Proposer and Metro Waste Authority will negotiate to develop the contents of the final design package. Metro Waste Authority's requested sections are included below. **These are NOT required in the proposal bid.** The "Proposal Requirements" section specifies detailed bid submission requirements.

- **Solar PV Description**
A summary of the solar PV system types, sizes, annual production, and site locations.
- **Schedule**
The equipment procurement and solar PV installation schedule for each site.
- **Design and Engineering Documents**
The design documents for all elements of the project, including, but not limited to, structural, architectural, mechanical, and electrical. Drawings shall be stamped by an Engineer registered in the State of Iowa.
- **Site Drawings**
Layout drawing of installation site providing location of all equipment.
- **Equipment Details and Specifications**
A high-level summary listing all solar PV system equipment and their associated specification sheets.
- **Incentives**
The Proposer shall be responsible for completing and submitting in a timely manner all documentation required to qualify each system for available rebates and incentives. All RECs are to be assigned to the Metro Waste Authority.
- **Electrical Interconnection**
Interconnect application process has begun and arrangements are in place for installation.
- **Manuals**
This includes equipment, installation, and O&M manuals for proper system monitoring over the life of the contract.
- **Monitoring**
A description of controls, monitors, and instrumentation to be used for the solar PV system. This includes web-based monitoring for performance verification and public education.
- **Safety Plan**
The Proposer's plan to ensure safety for all personnel. The Proposer shall report accidents, claims, and other on-going safety related issues to Metro Waste Authority in a manner consistent with MWA-wide reporting systems.
- **Quality Control Plan (QCP)**
At a minimum, the QCP should conform to "IEC 62446 Grid-Connected PV Systems – Minimum Requirements for System Documentation, Commissioning Tests, and Inspections."
- **Construction Plan**
This includes the appropriate documentation, plan, and timeline. All submittals, drawings, disruption plans, and contract documents shall be reviewed prior to submittal for design review/permits. The sites, except for the solar PV system footprint, shall be returned to pre-construction condition as needed.
- **Close Out Report**
The Proposer shall report progress of project contract closeout to Metro Waste Authority in a manner consistent with MWA's reporting requirements. At a minimum, this should include the following information: system nameplate size, overall installed system cost, and estimated and guaranteed annual kWh production (if applicable).

SECTION V. SCHEDULE

The schedule for this RFP is as indicated below. It may be modified at the discretion of Metro Waste Authority. An addendum will be issued in the event of any scheduling changes.

Responsible Party	Project Milestone	Date/Time
MWA	RFP Issued	October 20, 2021
MWA	Site Walkthrough	October 26, 2021, 10 A.M.
Proposer	RFP Questions Deadline	October 27, 2021
MWA	Answers to RFP Questions Distributed	October 29, 2021
Proposer	Notice of Intent to Submit Proposal Deadline	November 3, 2021
Proposer	RFP Deadline	November 9, 2021, 4:00 P.M.
MWA	Selection of Recommendation for Award	November 17, 2021
MWA & Proposer	Contract Executed	November 19, 2021
MWA & Proposer	Systems Commissioning & Operation Deadline	January 31, 2022*

*According to timeline on DNR grant, data should be gathered from panel operation from January 2022-December 2022.

The schedule dates are subject to change at the sole discretion of MWA.

Questions Pertaining to the RFP

Please submit questions via email to Nicholas Johnson at njo@mwatoday.com by October 27th, 2021. Michael McCoy (mmc@mwatoday.com) should be cc'd on all emails. Responses to questions will be shared with all Proposers.

Notice of Intent to Submit Proposal

Respondents must submit via email to njo@mwatoday.com their Notice of Intent to Submit a proposal by November 3rd, 2021 to ensure receipt of all addendums and other project documents. Addendums to this RFP based on submitted technical questions, along with changes to the proposal schedule, will be issued via email to Proposers who have confirmed intent to submit.

RFP Submission Guidelines

One electronic proposal shall be submitted via email to Nicholas Johnson at njo@mwatoday.com. The proposal must be signed by a company official authorized to make a legal and binding offer submitted to the address listed. Any bid may be withdrawn at any time prior to the due date with a written request signed by the authorized respondent representative. Revised proposals may be submitted up to the original due date/time. Bid proposals shall remain valid for 90 days after the RFP due date.

Selection Process

Depending on the number and quality of the proposals received, Metro Waste Authority reserves the right to either not select or select a vendor. The successful respondent will align on a formal agreement with Metro Waste Authority.

SECTION VI. PROPOSAL REQUIREMENTS

One electronic proposal shall be submitted via email to Nicholas Johnson at njo@mwatoday.com. The proposal must be signed by a company official authorized to make a legal and binding offer submitted to the email address listed. Proposals received after the proposal submission deadline will be returned to the respondent un-opened. Proposals will not be considered for award unless submitted in the format described below. Fax proposals will not be accepted.

- **Cover Letter**

Cover letter must be addressed to Michael McCoy, Executive Director, and signed by a legally authorized representative of the respondent. It must summarize key provisions of the proposal and include the respondent contact's name, address, phone and email. Specify if the Proposal includes any Proposer's trade secrets that must be shielded in case Metro Waste Authority is subject to the Freedom of Information Act (FOIA).

- **Executive Summary**

Include key provisions of the proposal, including understanding of Metro Waste Authority's goals, pricing, respondent's role on project, brief description of proposed system, financing, relevant experience with local governments, and key timeline dates.

- **Technical Solution**

Describe your technical approach to the design and construction of the solar project including:

- Technical approach, design, equipment, and installation;
 - Guaranteed power capacity (kW-DC and kW-AC) at each identified facility;
 - Estimated annual electricity production (kWh-AC);
 - Panel, inverter, ballasts;
 - Equipment and workmanship warranties.
- Attachments showing the conceptual physical layout of the proposed PV arrays, inverter, and conduit;
- PVSYST or similar report indicating production of the proposed systems;
- Proposed monitoring system including, but not limited to, equipment requirements, data output, and maintenance requirements.
- Operations & maintenance plan offered for the project.

- **Executive Summary**

Include key provisions of the proposal, including understanding of Metro Waste Authority's goals, pricing, respondent's

- **Proposer Profile**

Years in business, description of background working with local governments, applicable state licensing, OSHA background and safety protocol, insurance, workman's compensation rating, and quality control documentation.

- **Project Experience**

Include a minimum of 4 and maximum of 10 projects completed in the last 3 years similar in scope and complexity to the proposed project. Highlight companies permitting and interconnection experience with local utility.

- **References**

Provide 3 project references, including the contact person's name, email address, telephone number, and organization, as well as the nature of work performed, its location, and total project size (kW).

- **Litigation**

Indicate whether the Proposer, any team member, or any corporate officers have been party to any lawsuit involving the performance of any equipment it has installed and provide a summary of the issues and lawsuit status.

- **Project Team**

Organization chart and bios (length of time with firm, key projects, work history) of key team members and subcontractors, and their capability to perform work. Please only profile individuals that will directly be working on this project. Clearly identify the project manager.

- **Safety**

Include a brief description of the safety practices of your firm, as well as the OSHA Reporting Indicators for the last 3 years.

- **Proposed Schedule**

Identify key project milestones and include any necessary review periods for Metro Waste Authority.

- **Additional Information (Optional)**

If the Proposer believes that additional information must be included in their bid that is not covered in the above sections, it can be included in this section.

SECTION VII. PROPOSAL EVALUATION

Metro Waste Authority will evaluate proposals according to the evaluation criteria below. Points will be awarded based on the relative merit of the information provided in the response to the solicitation. Selection will be based on the total number of points awarded by the evaluation committee and result in a proposal for negotiation of a contract. Metro Waste Authority reserves the right to make multiple awards, one award, or no awards as a result of this solicitation.

- Proposal Cost 50 points
- Technical Approach/ Implementation Schedule 10 points
- Proposal's Alignment to Proposed Format 5 points
- Proposer's State of Iowa Presence 5 points
- Proposer Qualifications/Project Experience 30 points

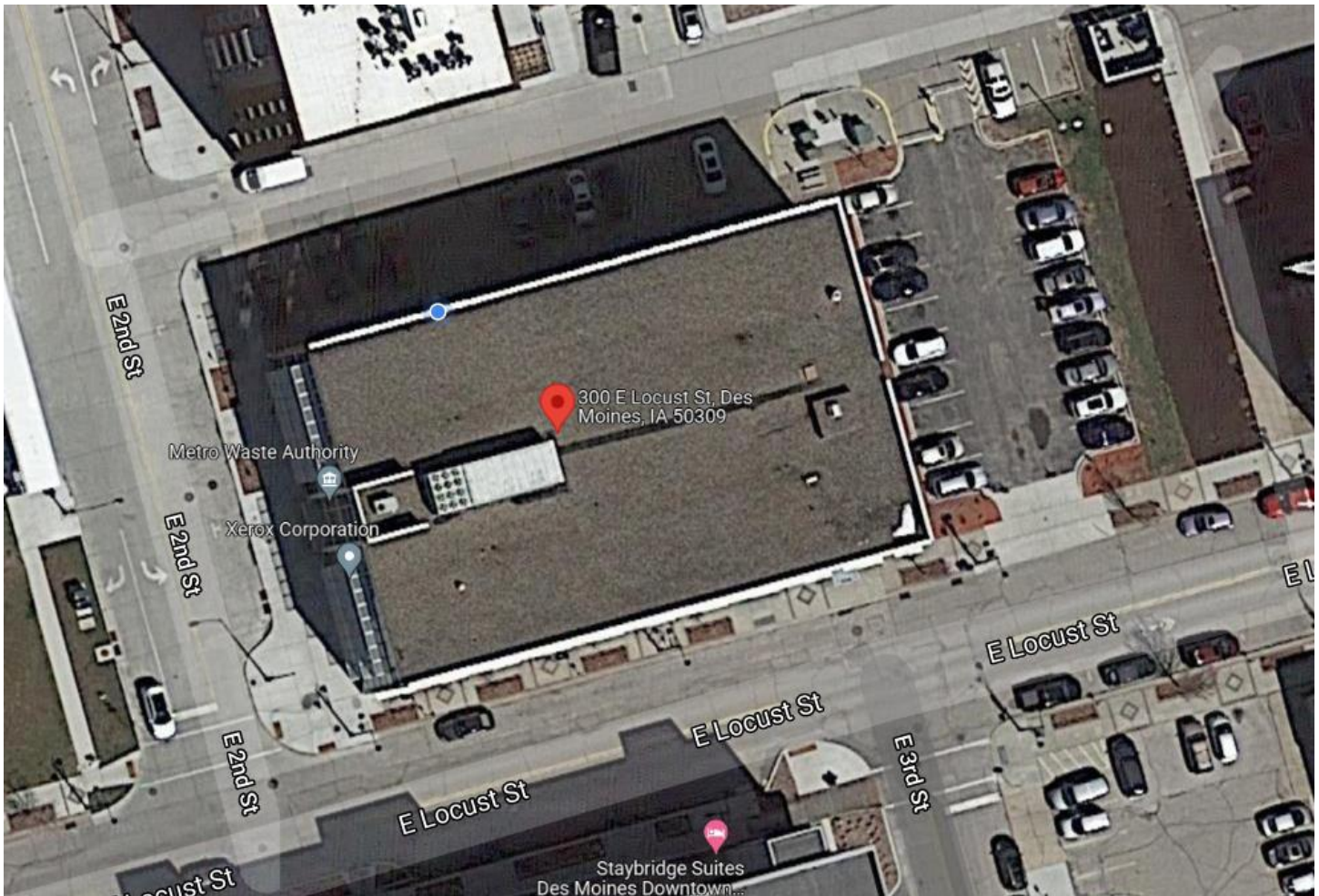
Metro Waste Authority may elect to conduct interviews with selected respondents to ask questions or for more detail on the proposed project. Metro Waste Authority reserves the right to seek supplemental information from any respondent at any time after official proposal opening and before award. This will be limited to clarification or more detail on information included in the original proposal. Upon acceptance of a proposal and intent to award, the successful respondent will be required to execute and return all required project documents and certificates of insurance within 10 business days from the Notice of Award. Should the selected firm fail or refuse to execute the project documents, Metro Waste Authority reserves the right to accept the next best proposal.

SECTION VII. METRO WASTE AUTHORITY CONTACT PERSON

Nick Johnson
Executive Coordinator
515.323.6519
njo@mwatoday.com

Attachment 1

Rooftop of 300 E Locust, Des Moines



Attachment 2

Draft contract to be included in released RFP

Attachment 3

12 months of utility statements to be included in released RFP

SLINGSHOT

ARCHITECTURE

October 6, 2021

Mr. Michael McCoy
Metro Waste Authority
300 East Locust Street
Des Moines, IA 50309

RE: Solar RFP, Design Drawings and Specifications

Mr. McCoy,

Attached are drawings and specifications for the Solar RFP design.

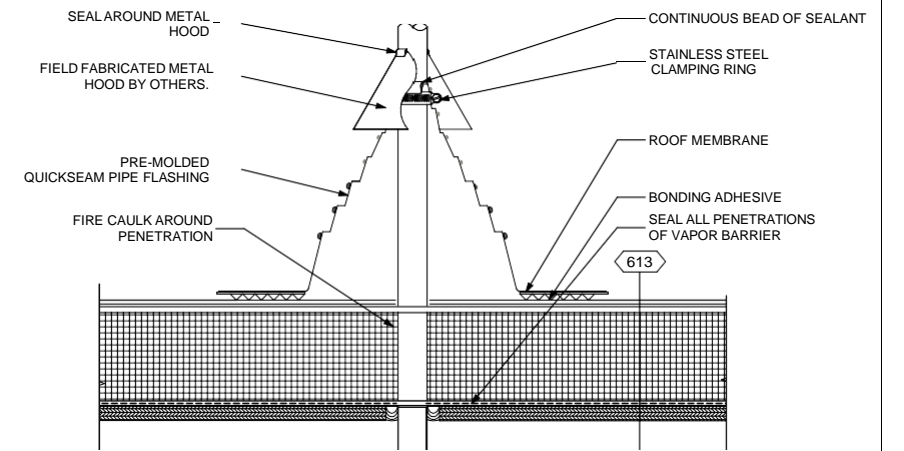
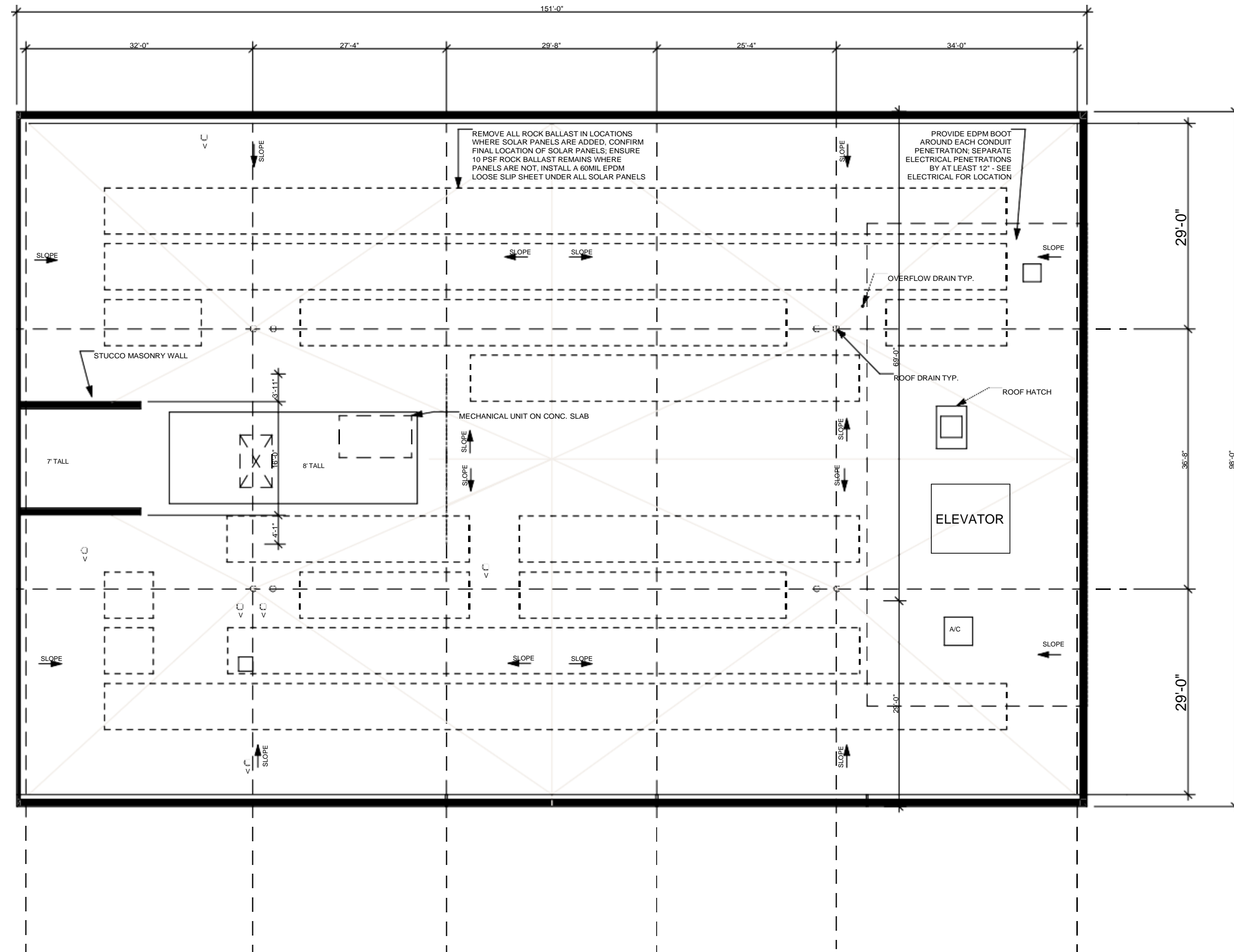
Attached are as follows:

- A.101 - Roof Plan
- E.000 - Electrical Cover Sheet
- E.101 - First Floor Plan
- E.103 - Third Floor Plan
- E.104 - Roof Plan
- Specifications - 26 0050, 26 0519, 26 0526, 26 0529, 26 0533, 26 0553, 26 2726, 26 2816, 26 9000,

We estimate the budget to be \$200,000 for solar panels and associated electrical work. Roofing patching will be minimal, allow \$3,000. Removal of roof ballast is necessary where solar panels will be located to avoid reinforcing of the existing roof structure. Budget \$12,000 for this removal. An EPDM loose slip sheet should be installed under the solar panels. Budget \$15,000. We would recommend carrying general conditions and contingency in the amount of \$23,000 (10%). Total project budget of \$253,000.

Respectfully submitted,

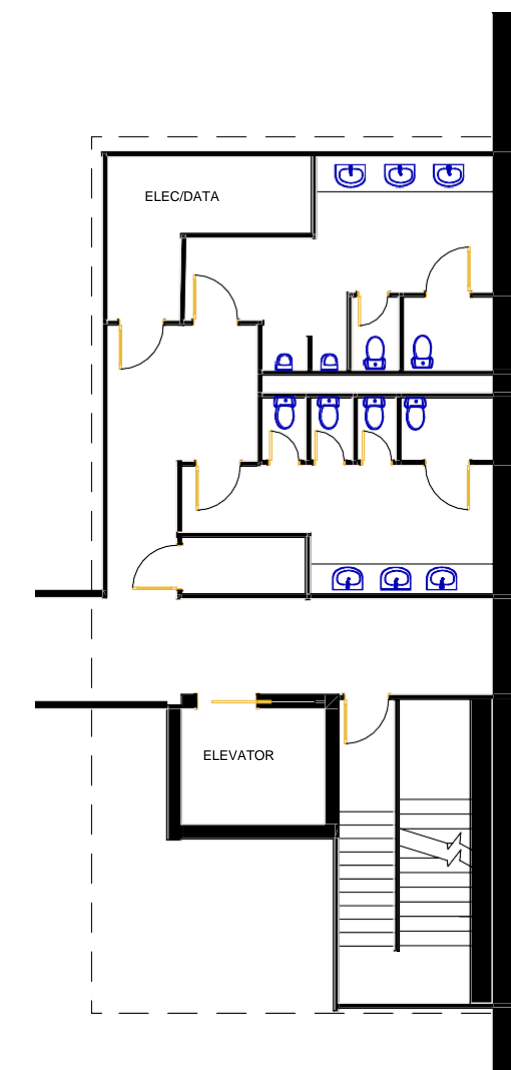
David Voss, AIA
Principal
Slingshot Architecture, Inc.



3
A.101

EPDM BOOT @ ELEC. PENETRATION

SCALE: 3" = 1'-0"



2
A.101

THIRD FLOOR PARTIAL PLAN
SCALE: 1/8" = 1'-0"

1 ROOF PLAN
A.101 SCALE: 1/8" = 1'-0"

SOLAR RFP

021.16

* PROJECT STATUS ***
2021.10.07

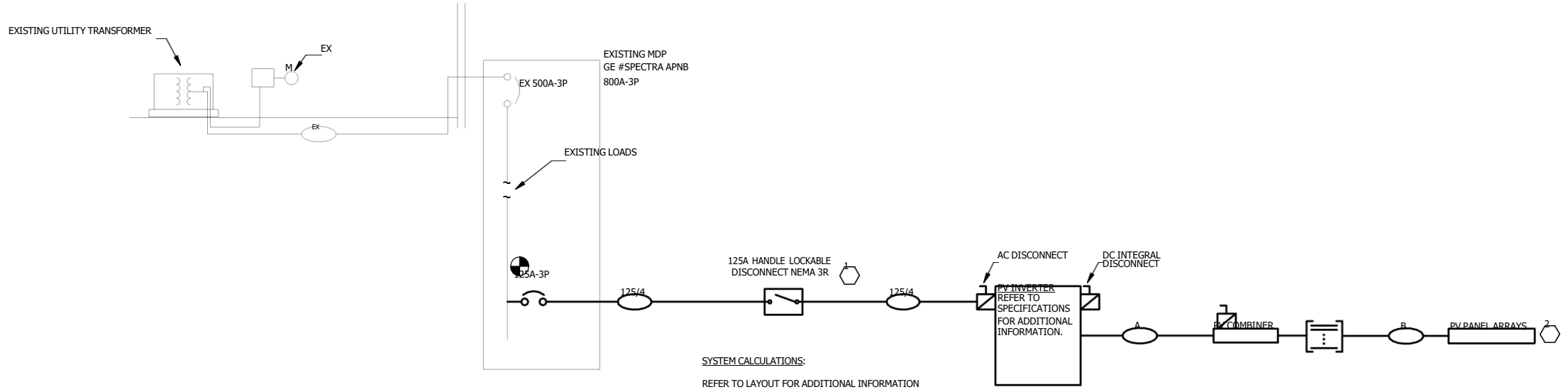
REVISION SCHEDULE		
D.	DESCRIPTION	DATE

DOOF PLAN

A.101

PRELIMINARY - NOT FOR CONSTRUCTION

ELECTRICAL RISER
No Scale



NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN
WORK WITH ARCHITECT'S DRAWINGS.

ELECTRICAL SYMBOLS LIST

NOTE: NOT ALL SYMBOLS SHOWN MAY BE REQUIRED FOR THIS PROJECT

WIRING DEVICES

- ⏏ DUPLEX WALL RECEPTACLE
- ⏏ DUPLEX WALL RECEPTACLE ABOVE COUNTER BACKSLASH OR AS INDICATED
- ⏏ DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- ⏏ DUPLEX TAMPER-RESISTANT RECEPTACLE
- ⏏ DUPLEX WEATHERPROOF GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE WITH COVER
- ⏏ DUPLEX RECEPTACLE INSTALLED HORIZONTALLY
- ⏏ DUPLEX RECEPTACLE ON BACKUP POWER
- ⏏ QUADRUPLUX RECEPTACLE
- ⏏ QUADRUPLUX RECEPTACLE ABOVE COUNTER BACKSLASH OR AS INDICATED
- ⏏ DUPLEX CEILING RECEPTACLE
- ⏏ JUNCTION BOX

DISTRIBUTION

- ⏏ SURFACE-MOUNT PANEL
- ⏏ FLUSH-MOUNT PANEL
- ⏏ TRANSFORMER
- ⏏ METER

EQUIPMENT WIRING

- ⏏ DISCONNECTING MEANS
- ⏏ WEATHERPROOF DISCONNECTING MEANS
- ⏏ FUSED DISCONNECTING MEANS
- ⏏ MOTOR STARTER
- ⏏ VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT
- ⏏ MOTOR RATED SWITCH

MISCELLANEOUS

- EX EXISTING - TO REMAIN
- ER EXISTING - TO BE RELOCATED
- ER EXISTING - TO BE REMOVED
- CONDUIT
- SWITCH-LEG IN CONDUIT
- UNDER GROUND CONDUIT
- EMPTY CONDUIT
- POINT OF NEW CONNECTION
- WP WEATHERPROOF
- AFF ABOVE FINISHED FLOOR
- AFG ABOVE FINISH GRADE
- WM DEVICE ON WIREMOLD
- WG WIRE GUARD
- [FS] FIRE STOP
- EZ PASS-THROUGH

COMMUNICATIONS SYSTEMS

- TELEPHONE OUTLET FOR WALL MOUNTED TELEPHONE
- DATA OUTLET IN WALL W/ # OF JACKS
- DATA OUTLET ABOVE COUNTER BACKSLASH
- WIRELESS ACCESS POINT
- DATA OUTLET IN CEILING
- TELEVISION OUTLET IN WALL
- INTERCOM PUSH BUTTON
- AV JUNCTION BOX LOCATION
- ADA PUSH BUTTON

GENERAL NOTES:

- ELECTRICAL POWER OUTAGES, IF REQUIRED, SHOULD BE STRATEGICALLY MINIMIZED AND SCHEDULED CLOSELY WITH OWNER. CHANGEOVERS COULD BE REQUIRED TO OCCUR AT ANY HOUR.
- MAINTAIN ALL SERVICE CLEARANCES REQUIRED BY THE UTILITY.
- INSTALL ALL CONDUCTORS PER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL FOLLOW APPROVED UTILITY INTERCONNECTION APPLICATION.

REFERENCED NOTES:

- (NOT ALL NOTES MAY BE APPLICABLE TO THIS SHEET)
- COORDINATE EXACT LOCATION OF UTILITY PV DISCONNECT WITH UTILITY PRIOR TO ROUGH-IN. AT LOCATION OF PV UTILITY DISCONNECT SHALL BE A PERMANENT PLAQUE READING "INTERCONNECTION DISCONNECT SWITCH". DISCONNECT SHALL NOT OPEN THE NEUTRAL. COORDINATE ALL UTILITY REQUIREMENTS WITH UTILITY PRIOR TO ROUGH-IN.
 - GROUND PV SYSTEM AS PER NEC 690.

SHEET INDEX

- E000 COVER SHEET
- E101 FIRST FLOOR PLAN
- E103 THIRD FLOOR PLAN
- E104 ROOF PLAN

PROJECT MANAGER
JOSEPH NIELSEN
JNIELSEN@MODUS-ENG.COM
ELECTRICAL ENGINEER
COLE SCHUMACHER
CSCHUMACHER@MODUS-ENG.COM

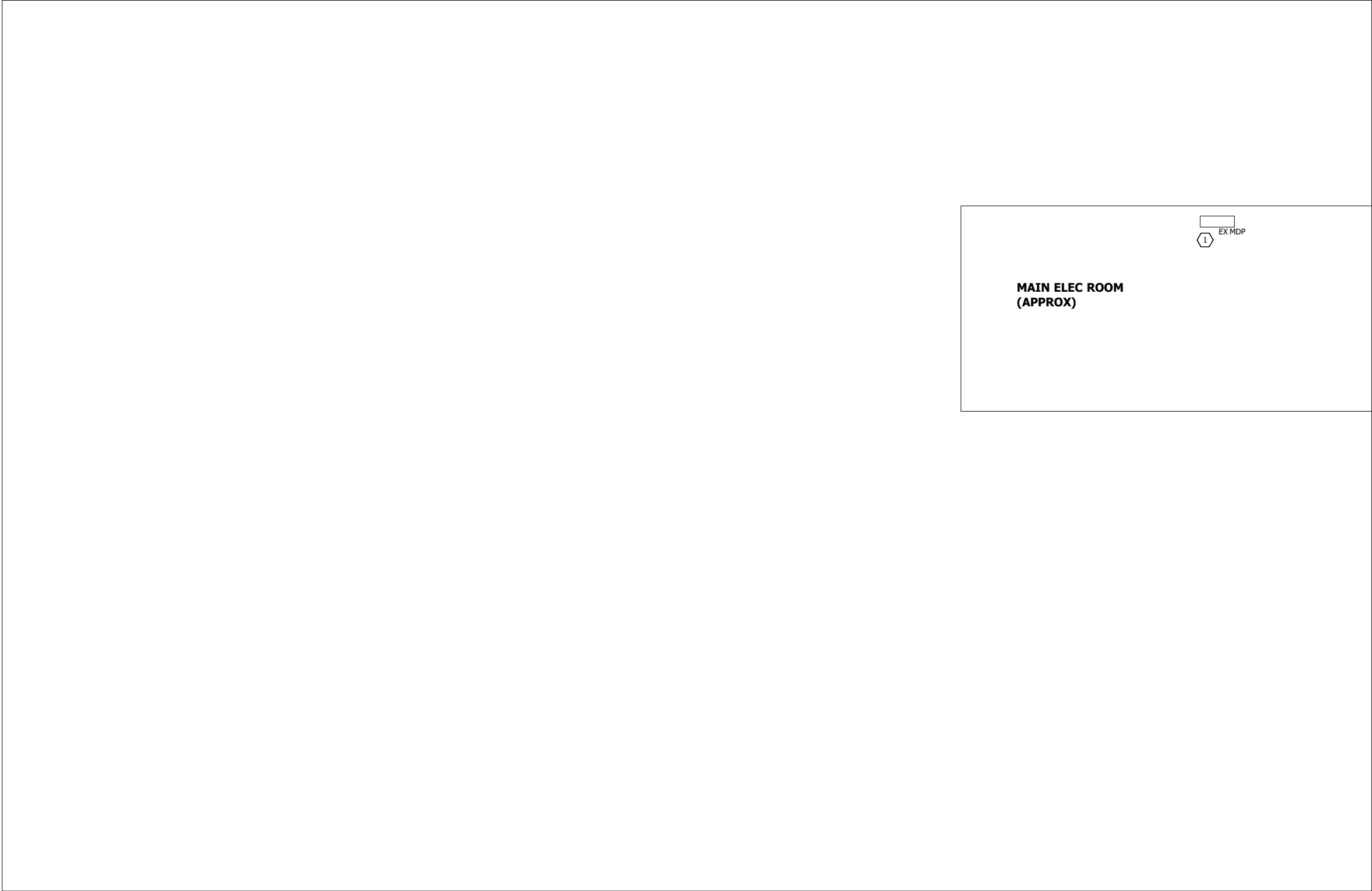


21-141 MWA HQ PV DESIGN

300 E Locust St #100, Des Moines, IA 50309

DATE	10/01/21	VERSION	REVIEW DOCUMENTS
SHEET NAME:	COVER SHEET		
SHEET:	E000		

1 FIRST FLOOR PLAN
NO SCALE



EX METERING CABINET
AND METER
(APPROXIMATE LOCATION)

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN
WORK WITH ARCHITECT'S DRAWINGS.

GENERAL NOTES:

- A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.
- B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.
- C. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
- D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.
- E. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

REFERENCED NOTES:

- (NOT ALL NOTES MAY BE APPLICABLE TO THIS SHEET)
- 1. PROVIDE NEW BREAKER IN SWITCHBOARD 'MDP' FOR NEW SOLAR INVERTERS. UTILIZE EXISTING PROVISION IN SWITCHBOARD.



2 PHOTO OF EX METER
NO SCALE

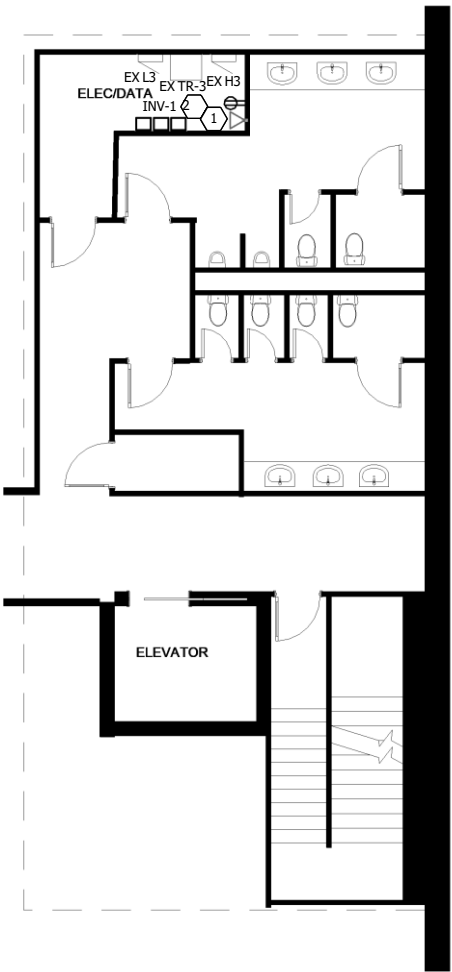


21-141 MWA HQ PV DESIGN

300 E Locust St #100, Des Moines, IA 50309

DATE	10/01/21	VERSION	REVIEW DOCUMENTS
SHEET NAME:	FIRST FLOOR PLAN		
SHEET:	E101		

1 THIRD FLOOR PLAN
No Scale



NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN
WORK WITH ARCHITECT'S DRAWINGS.

GENERAL NOTES:

- A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.
- B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.
- C. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
- D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.
- E. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL. RECEPTACLES PER NEC 406.12 AND 517.18 (C).

REFERENCED NOTES: #

- 1. PROVIDE NECESSARY CONNECTIONS FOR TRACKING WEB INTERFACE IN ELECTRICAL ROOM. CIRCUIT DEVICE TO A SPARE 20A-1P CIRCUIT BREAKER IN 208V BRANCH PANEL. IN ELECTRICAL ROOM, PROVIDE ROUGH-IN FOR DATA CONNECTION. DATA DEVICE AND CABLING INSTALLATION PERFORMED BY OWNER.
- 2. RIGIDLY MOUNT INVERTERS TO SOUTH WALL. COORDINATE EXACT LOCATION TO MAINTAIN NEC CLEARANCE OF EXISTING ELECTRICAL EQUIPMENT.

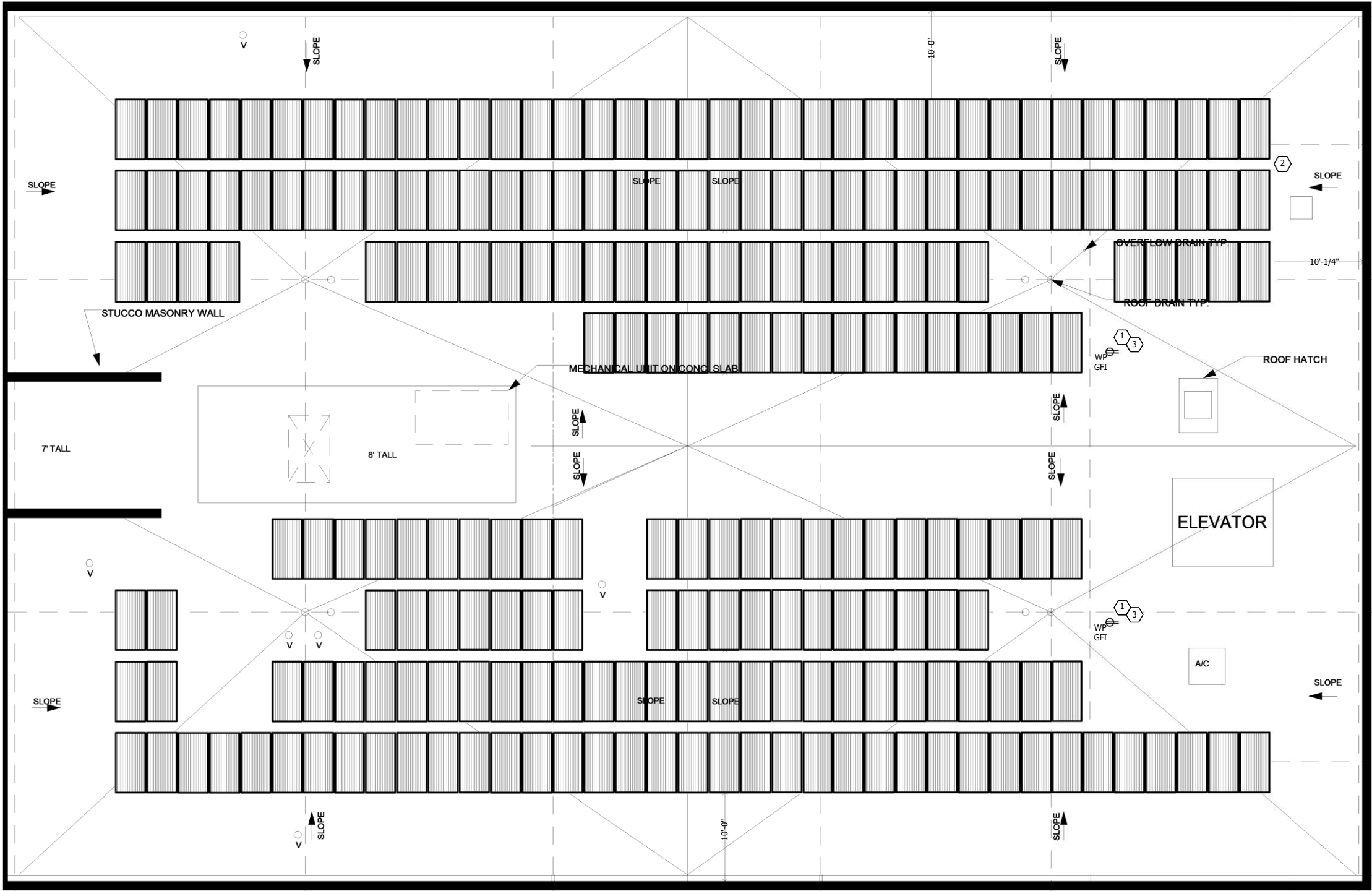


21-141 MWA HQ PV DESIGN

300 E Locust St #100, Des Moines, IA 50309

DATE	10/01/21	VERSION	REVIEW DOCUMENTS
SHEET NAME:		THIRD FLOOR PLAN	
SHEET:		E103	

1 ROOF ELECTRICAL PLAN
1/8" = 1'-0"



Components		
Component	Name	Count
Inverters	SE100KUS (SolarEdge)	1 (100.0 kW)
Strings	10 AWG (Copper)	7 (581.8 ft)
Optimizers	P860 (SolarEdge)	126 (108.4 kW)
Module	Silfab Solar Inc., SIL-400 NU (400W)	245 (98.0 kW)

SYSTEM SCHEDULE

Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13-38	Along Racking

Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	10°	74.2°	0.0 ft	1x1	245	245	98.0 kW

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN
WORK WITH ARCHITECT'S DRAWINGS.

GENERAL NOTES:

- A. ALL DISCONNECTS ON EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.
- B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.
- C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
- E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.
- F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.
- G. PROVIDE AND INSTALL ALL ELECTRICAL CONTROL AND DISCONNECTING MEANS FOR ALL PHOTOVOLTAIC EQUIPMENT. COORDINATE AND VERIFY REQUIREMENTS WITH SCHEDULES AND SHOP DRAWINGS.

REFERENCED NOTES:

- 1. PV COMBINER CABINET, 600V, CIRCUITS FUSED AT 15 AMPS, NEMA 3R AND UL 1741 LISTED. PROVIDE WEATHER PROOF DISCONNECT AT COMBINER. COORDINATE EXACT LOCATION AND FEEDER ROUTE WITH DESIGN TEAM PRIOR TO INSTALLATION. THE INVERTER AND OPTIMIZERS SHALL BE EQUIPPED WITH A RAPID SHUTDOWN FEATURE THAT CONFORMS TO NEC 690.12.
- 2. CONDUIT TO PENETRATE ROOF FOR CONNECTION TO INVERTER. REFER TO ARCHITECTURAL DRAWINGS FOR PENETRATION LOCATION AND REQUIREMENTS.
- 3. INSTALL COMPONENTS FOR SOLAR ARRAY ON ROOF-MOUNTED UNISTRUT. COORDINATE ROOF PENETRATION WITH ROOF DETAILS.



21-141 MWA HQ PV DESIGN
300 E Locust St #100, Des Moines, IA 50309

DATE	VERSION	REVIEW DOCUMENTS
10/01/21		
SHEET NAME: ROOF PLAN		
SHEET: E104		

SECTION 26 0050
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Basic Electrical Requirements specifically applicable to Electrical Division Specification Sections.

1.02 WORK BY OWNER

- A. The Following Work or Sub Contracts Will Be Supplied and Furnished By The Owner:
 - 1. Interconnect Agreement
- B. Contractor's Responsibility:
 - 1. Review owner reviewed Interconnect Agreement.

1.03 OWNER OCCUPANCY PROVIDED

- A. The owner will occupy the premises during the construction period.
- B. Limit use of site and premises to allow owner occupancy.
- C. Cooperate with the owner to minimize conflict and to facilitate owner's operations.
- D. Schedule the work to accommodate this requirement.

1.04 REGULATORY REQUIREMENTS

- A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.
- B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.
- C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.
- D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.
- E. All work shall comply with the applicable recommendations of:
 - 1. The National Board of Fire Underwriters
 - 2. The ANSI-NFPA 70 National Electrical Code
 - 3. The National Fire Protection Association (NFPA)
 - 4. The Occupations Safety and Health Act (OSHA)
 - 5. IBC Building Code (current) and any current applicable city building and or electrical codes.
 - 6. Fire Protection: Conform to International Fire Code (IFC) and NFPA.
- F. Conform to latest approved versions of codes.

1.05 PROJECT/SITE CONDITIONS

- A. Install work in locations shown on drawings unless prevented by project conditions.
- B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.
- C. This contractor, before submitting their bid, shall visit the site of the project to familiarize themselves with locations and conditions affecting their work.
- D. It is the intent of this specification that the contractor furnish all labor and material required to complete the installation as outlined in the drawings and specifications. No additions to the

contract price will be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

- E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing wiring conduits, electrical panels, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.
- F. This contractor shall provide, as necessary, for the installation of their work and in accordance with materials other than the structure.

1.06 OWNER'S RIGHT OF SALVAGE

- A. Before beginning construction, the contractor shall check and verify with the owner each item of existing equipment that must be removed.
- B. The owner will designate which items of material or equipment not reused that they may wish to keep. The contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.
- C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from the site.

1.07 PROTECTION AND MAINTENANCE

- A. Where necessary to connect to any existing utility service, this electrical contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.
- B. This contractor shall protect existing equipment in finished areas from dirt, dust and damage as a result of their work.

1.08 DEMOLITION

- A. Preserve services to the existing facility. Extend/reroute/reconnect the existing systems as required providing for the continued function of these systems.

1.09 CUTTING AND PATCHING

- A. This contractor shall do all cutting and patching necessary for the installation of his work in all existing and new buildings unless otherwise noted.
- B. In areas where the integrity of new or existing fire separation assembly/wall is compromised by the work, this contractor shall be responsible to patch and/or seal openings as necessary to maintain and/or return fire separation to rating as required by applicable codes.

1.10 CLEANING AND RUBBISH

- A. This contractor, upon completion of their work, shall remove all rubbish and debris resulting from their operation and shall remove it from site at their own expense.
- B. As far as their work is concerned, all equipment shall be cleaned and the premises left in first class condition.

1.11 SEALING AND PENETRATION

- A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.
- B. Manufacturer offering products to comply with the requirements include the following:
 - 1. Dow Corning "Silicone RTV Foam"
 - 2. 3-M Corporation "Fire Barrier Caulk and Putty"
 - 3. Thomas & Betts "Flame Safe Fire Stop System"
- C. Installation of these products are to be in strict accordance with the manufacturer's recommendations.

- D. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.12 HAZARDOUS MATERIALS

- A. If the contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them at the site. The contractor shall inform the owner and all employed of any potential exposure to this material.
- B. At no time shall any product containing asbestos be incorporated into the work.
 - 1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.13 AS-BUILT DRAWINGS

- A. This electrical contractor shall provide (at the conclusion of the project) one clean, non-torn, neat and legible "as-built" set of drawings to the owner. These drawings shall show the routing of conduit, wiring and equipment drawn in at scaled locations. All circuits shall be labeled and shall conform to labeled panel breakers. All dimensions indicated shall be referenced to a column line. A set of construction drawings will be furnished for this work.
- B. All electrical panels and electrical installed equipment shall be shown on the "as-built" drawings.

1.14 REVIEW OF MATERIALS

- A. This contractor shall submit to the engineer for review one (1) electronic copy giving a complete list of materials, fixtures, devices and panels they propose to furnish. The brochure shall contain complete information as to the make of equipment, type, size, capacities, dimensions, and illustration. One of the returned copies shall be kept on the job at all times.
- B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer, in writing, of such deviation at time such drawings are furnished.
- C. This contractor shall mark the date and sign each set. This indicates that each of them have been checked in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted or checked and will be marked "resubmit" and sent back to the contractor.

1.15 TEST OF SYSTEMS

- A. This contractor shall, before concealed, test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.
- B. This contractor shall be held responsible for all damage resulting from defects in the system.
- C. Each individual feeder circuit shall be tested at the panel and in testing for insulation resistance to ground; the power equipment shall be connected for proper operation. In no case shall the insulation resistance to ground be less than that required by the National Electrical Code (NEC).

1.16 SCOPE OF WORK

- A. This contractor shall furnish all the labor and material necessary to install a complete electrical system for the building. The system shall include all items of work as outlined in these specifications and on the drawings.
- B. All work shall be performed by a well-qualified, licensed electrician with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their employees are familiar with all the various codes and tests applicable to this work.
- C. All equipment shall be new and of the type specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

- D. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer's attention and an addendum is issued for clarification.

1.17 ELECTRICAL UTILITY COMPANY

- A. Any fees by the utility company are to be billed directly to the owner.
- B. The contractor is required to assist the owner in the preparation of all utility company rebate forms that deal with equipment furnished and/or installed as a part of this contractor.

1.18 SECURE NETWORKABLE DEVICES

- A. Update network devices to the most current software/firmware.
- B. Change default password of all networkable devices.
 - 1. Passwords shall have at least eight characters.
 - 2. Include uppercase and lowercase letters, numerals, and special characters
- C. Supply MAC address and serial number of all networkable devices.
- D. Work with the Owner's IT department to align to existing IT standards.
- E. Provide to the owner a printed and/or electronic spreadsheet log of all network information including, IP addresses, MAC addresses, logins and password information during system training.

1.19 SYSTEM CONFIGURATION AND PROGRAMMING FILES

- A. Supply system configuration and programming files where export is available.
- B. Supply uncompiled programming for systems applicable.
- C. All configuration and programming shall be property of the owner at conclusion of the project.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 26 0050

SECTION 26 0519
ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building wire
- B. Wiring connectors

1.02 RELATED SECTIONS

- A. Specification Section 26 0553 - Identification for Electrical Systems

1.03 REFERENCES

- A. NECA Standard of Installation (National Electrical Contractors Association)
- B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association)
- C. NFPA 70 - National Electrical Code
- D. Product Data: Provide for each cable assembly type.
- E. Test Reports: Indicate procedures and values obtained.
- F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.04 SUBMITTALS

- A. Project Record Documents: Record actual locations of components and circuits.
- B. Project Record Documents: Provide documentation of the manufacturer's recommended lug torque value for aluminum conductors, the date the lugs were torqued, and installed torque readings.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

- A. Conform to NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 PROJECT CONDITIONS

- A. Verify that field measurements are as indicated.
- B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 foot of length shown.

1.08 COORDINATION

- A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

PART 2 PRODUCTS

2.01 BUILDING WIRE

- A. Manufacturers:
 - 1. Okanite
 - 2. Bell/Hubbell #BICC
 - 3. American Insulated Wire
 - 4. General Cable
 - 5. Southwire
 - 6. United Copper Industries

- 7. Encore Wire Corporation
- 8. Engineer approved equal.
- B. Description: Insulated conductor wire.
 - 1. All wire shall be stranded. Refer to Section 26 0553 Identification for Electrical Systems for conductor color requirements.
 - 2. Wire sizes #12 AWG and smaller shall be solid. Wire sizes #10 AWG and larger shall be stranded.
 - 3. Provide solid wire pigtails at all wiring devices and lighting control devices.
- C. Conductor:
 - 1. Copper
 - 2. Feeders, where sizing is indicated at the Electrical Riser Diagram, may use compact aluminum equal to Southwire #AlumaFlex® Aluminum (AA-8176) Conductor.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation: NFPA 70, type #THHN/THWN-2. All cable installation procedures or sizing shall be based on 75 deg C temperature rating.

2.02 WIRING CONNECTORS

- A. Split Bolt Connectors:
 - 1. Burndy
 - 2. Engineer approved equal.
- B. Spring Wire Connectors:
 - 1. Thomas & Betts
 - 2. Engineer approved equal.
- C. Compression Connectors:
 - 1. Burndy
 - 2. Thomas & Betts
 - 3. Engineer approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that raceway installation is complete and supported.

3.02 WIRING METHODS

- A. Exterior Locations: Use only building wire, type #THHN/THWN-2 insulation, in raceway. Use liquid-tight wiring methods. Use liquid-tight connections.
- B. Interior Installations: Use only building wire, type #THHN/THWN-2 insulation, in raceway.
- C. Use wiring methods indicated.

3.03 INSTALLATION

- A. Route wire and cable as required meeting project conditions.
- B. Install cable in accordance with the NECA "Standard of Installation."
- C. Use stranded conductors for feeders and branch circuits larger than 12 AWG.
- D. Use #10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
- E. Use #10 AWG conductors for 20 ampere, 208/240 volt branch circuits longer than 200 feet.
- F. It shall be the responsibility of the electrical contractor to verify all voltage drop and size all wire accordingly.
- G. Pull all conductors into raceway at same time.
- H. Use suitable wire pulling lubricant for building wire #4 AWG and larger.
- I. Clean conductor surfaces before installing lugs and connectors.

- J. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- K. Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- L. Identify and color code wire and cable under provisions of Specification Section 26 0553 - Identification for Electrical Systems. Identify each conductor with its circuit number or other designation indicated.

3.04 FIELD QUALITY CONTROL

- A. Perform field inspection and testing.
- B. Inspect wire and cable for physical damage and proper connection.
- C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- D. Verify continuity of each branch circuit conductor.

END OF SECTION 26 0519

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mechanical connectors
- B. Wire

1.02 SUMMARY

- A. Provide all labor, materials, and equipment necessary to properly install a grounding system conductor in all new wiring, which shall be in full compliance with all applicable codes as accepted by the authorities having jurisdiction. The secondary distribution system shall include a grounding conductor in all raceways in addition to the return path of the metallic conduit.
- B. Provide and install all grounding and bonding as required by the National Electrical Code (NEC) including but not limited to Article 800 of the NEC.

1.03 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code
- B. IEEE 837-2014: Standard for Qualifying Permanent Connections Used in Substation Grounding
- C. IEEE Emerald Book
- D. IEEE Green Book

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 MECHANICAL CONNECTORS

- A. All grounding connectors shall be in accordance with UL 467 and UL listed for use with rods, conductors, reinforcing bars, etc., as appropriate.
- B. Connectors and devices used in the grounding systems shall be fabricated of copper or bronze materials, and properly applied for their intended use. All connectors and devices shall be compatible with the surfaces being bonded and shall not cause galvanic corrosion by dissimilar metals.
- C. Lugs: Substantial construction, of cast copper or bronze with "ground" (micro-flat) surfaces, twin clamp, and two-hole tongue equal to Burndy QQA Series.
- D. Grounding and Bonding Bushings: Malleable iron.
 - 1. Manufacturers:
 - a. Thomas & Betts
 - b. Engineer approved equal.
- E. Grounding Screw and Pigtail: Raco #983.
- F. Mechanical lugs or wire terminals shall be used to bond ground wires together or to junction boxes and panel cabinets.

2.02 WIRE

- A. Material: Stranded copper.
- B. Size to meet NFPA 70 requirements as a minimum. Increase size if called for on drawings or in these specifications.
- C. Insulated THWN (or bare as noted elsewhere).

PART 3 EXECUTION

3.01 GENERAL

- A. Install products in accordance with manufacturer's instructions.
- B. Grounding shall meet (or exceed as required to meet these specifications) all the requirements of the N.E.C., the NFPA, and applicable standards of IEEE.
- C. Where there is a conflict between these specifications and the above applicable codes/standards or between this section of these specifications and other sections, then the most stringent or excessive requirement shall govern. Where there is an omission of a code/standard requirement in these specifications then the current code/standard requirements shall comply.
- D. Requirement in these specifications to comply with a specific code/standard article, etc. is not to be construed as deleting of requirements of other applicable codes/standards and their articles, etc.

3.02 GROUNDING CONDUCTORS

- A. Grounding conductors shall be provided with every circuit to meet (or exceed as required to meet these specifications and/or drawings) the requirements of NEC 250.
- B. At every voltage level, new portions of the electrical power distribution system shall be grounded with a dedicated copper conductor, which extends from termination back to power source in supply panelboard.
- C. Provide green insulated ground wire for all receptacles and for equipment of all voltages. In addition to grounding strap connection to metallic outlet boxes, a supplemental grounding wire and screw equal to Raco No. 983 shall be provided to connect receptacle ground terminal to the box.

3.03 EXTERIOR GRADE MOUNTED EQUIPMENT

- A. General:
 - 1. Bond each equipment enclosure, metal rack support, mounting channels, etc. to ground electrode system at each rack with an insulated copper ground conductor sized to match the grounding electrode conductor required by applicable table in NEC 250 based on equipment feeder size, but in no case shall conductor be smaller than #6 copper or larger than #2 copper. This connection is in addition to grounding electrode connections required for services.

3.04 MISCELLANEOUS GROUNDING CONNECTIONS

- A. Grounding conductors shall be so installed as to permit shortest and most direct path from equipment to ground; be installed in conduit; be bonded to conduit at both ends when conduit is metal; have connections accessible for inspection; and made with accepted solderless connectors brazed or bolted to the equipment or to be grounded; in NO case be a current carrying conductor; have a green jacket unless it is bare copper; be run in conduit with power and branch circuit conductors.
- B. All surfaces to which grounding connections are made shall be thoroughly cleaned to maximum conductive condition immediately before connections are made thereto. Metal rust proofing shall be removed at grounding contact surfaces, for 0 ohms by digital Vm. Exposed bare metal at the termination point shall be painted.
- C. All ground connections that are buried or in otherwise inaccessible locations, shall be welded exothermically. The weld shall provide a connection which shall not corrode or loosen and which shall be equal or larger in size than the conductors joined together. The connection shall have the same current carrying capacity as the largest conductor.
- D. Install ground bushings on all metal conduits where the continuity of grounding is broken between the conduit and the electrical distribution system (i.e. metal conduit stub-up from wall outlet box to ceiling space. Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.

3.05 TESTING AND REPORTS

- A. Raceway Continuity: Metallic raceway system as a component of the facilities ground system shall be tested for electrical continuity. Resistance to ground throughout the system shall not exceed specified limits.
- B. Upon completion of testing, the testing conditions and results shall be certified by the electrical contractor and submitted to the engineer.

3.06 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Use suitable test instrument with current certificate of calibration to measure resistance to ground of system.

END OF SECTION 26 0526

SECTION 26 0529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Product requirements
- B. Formed steel channel
- C. Sleeves

1.02 REFERENCES

- A. NECA Standard of Installation (National Electrical Contractors Association)
- B. NFPA 70 - National Electrical Code

1.03 SUBMITTALS

- A. Product Data: Provide manufacturers catalog data for fastening systems.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of products.

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

- A. Materials and Finishes:
 - 1. Corrosion resistant.
 - 2. Select materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit, including weight of wire in conduit.
- B. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Use expansion anchors and preset inserts.
 - 2. Steel Structural Elements: Use beam clamps and welded fasteners.
 - 3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
 - 5. Solid Masonry Walls: Use expansion anchors and preset inserts.
 - 6. Sheet Metal: Use sheet metal screws.

2.02 FORMED STEEL CHANNEL

- A. Manufacturers:
 - 1. Globe Strut
 - 2. Uni-Strut
 - 3. Kindorf
 - 4. Power-Strut
 - 5. Erico
 - 6. Engineer approved equal.
- B. Description: Galvanized steel.

2.03 SLEEVES

- A. For conduits passing through wall, below grade, underground wall sleeves for conduits 4" or larger shall be continuous rigid steel. Seal with Linkseal, or engineer approved equal, at two diameters larger than conduit.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions and utility company regulations where applicable.
- B. Provide anchors, fasteners and supports in accordance with NECA "Standard of Installation".
 - 1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
 - 2. Do not use spring steel clips and clamps.
 - 3. Do not use powder-actuated anchors.
 - 4. Do not drill or cut structural members.
- C. Fabricate supports from structural steel or formed steel members or steel channel. Rigidly weld members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- D. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- E. Use steel channel supports to stand cabinets and panelboards one inch (1") off wall in all wet and damp locations.
- F. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- G. All pathways and hangers shall be independently hung.

END OF SECTION 26 0529

SECTION 26 0533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Conduit requirements
- B. Conduit types
- C. Box types

1.02 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated
- C. ANSI C80.5 - Rigid Aluminum Conduit
- D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
- E. ANSI/NFPA 70 - National Electrical Code
- F. NEMA 250 - Enclosures for Electric Equipment
- G. NECA (National Electrical Contractor's Association) Standard of Installation
- H. NEMA WD 6 - Wiring Device Configurations

1.03 PROJECT RECORD DOCUMENTS

- A. Accurately record actual routing of conduits larger than two inches.
- B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.05 SUBMITTALS

- A. Product Data: Provide dimensions, knockout sizes and locations, materials, fabrication details, finishes, and accessories.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to the site.
- B. Accept products on site. Inspect for damage.
- C. Protect products from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.08 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on the drawings.
- B. Verify routing and termination locations of conduit prior to rough in.
- C. Conduit routing is shown on the drawings in approximate locations unless dimensioned. Route as required completing the wiring system.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

- A. Minimum Size: 1/2 inch for power wiring and 1 inch for low voltage wiring unless noted otherwise.
- B. Size conduit per ANSI/NFPA 70.
- C. Above Grade Outdoor Locations: Use rigid steel and aluminum conduit. Aluminum conduit shall not contact concrete mortar or block.
- D. Wet and Damp Locations:
 - 1. Use rigid steel conduit and intermediate metal conduit.
- E. Dry Locations:
 - 1. Concealed: Use rigid steel conduit, intermediate metal conduit or electrical metallic tubing.
 - 2. Exposed: Use rigid steel conduit, intermediate metal conduit or electrical metallic tubing.

2.02 CONDUIT TYPES

- A. Metal Conduit:
 - 1. Rigid Steel Conduit: ANSI C80.1
 - 2. Rigid Aluminum Conduit: ANSI C80.5
 - 3. Intermediate Metal Conduit (IMC): Rigid steel
 - 4. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.
- B. Flexible Metal Conduit:
 - 1. Description: Interlocked steel construction.
 - 2. Fittings: ANSI/NEMA FB 1.
- C. Liquidtight Flexible Metal Conduit:
 - 1. Description: Interlocked steel construction with PVC jacket.
 - 2. Fittings: ANSI/NEMA FB 1.
- D. Electrical Metallic Tubing (EMT):
 - 1. Description: ANSI C80.3; galvanized tubing.
 - 2. Fittings and Conduit Bodies: ANSI/NEMA FB 1; [steel compression type with steel lock nut, and ring or] steel setscrew fittings. Install compression type fittings in all wet and damp areas.
- E. Pre-manufactured Fixture Whips:
 - 1. Manufacturers:
 - a. Southwire
 - b. EPCO
 - c. Engineer approved equal.
 - 2. Description: UL listed flexible conduit with conductors and die-cast screw connectors on the end.
 - 3. Size: no longer than 6', 3/8" diameter.
 - 4. Wire: 14 AWG minimum for lighting and required by the load.
 - 5. Install between junction box and light fixture only in concealed and unfinished spaces. Use interior raceway or surface raceway where exposed in finished spaces.
- F. Fittings and Conduit Bodies:
 - 1. NEMA TC 3
 - 2. Install offsets at surface boxes.
 - 3. Install single hole strap connectors on all exposed conduit one inch (1") and smaller.

2.03 BOX TYPES

- A. General Requirements:
 - 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.

2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
- B. Outlet Boxes:
 1. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel. Minimum of 4 x 4 square with depth of 1-1/2 inch

PART 3 EXECUTION

3.01 CONDUIT INSTALLATION

- A. Install conduit in accordance with NECA "Standard of Installation."
- B. Arrange supports to prevent misalignment during wiring installation.
- C. Support conduit using coated steel, malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Fasten conduit supports to building structure and surfaces.
- E. Arrange conduit to maintain headroom and present neat appearance.
- F. Route exposed conduit parallel and perpendicular to walls.
- G. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degree F.
- H. A run of conduit shall not contain more than the equivalent of four (4) quarter bends (360 degrees), including those bends located immediately at the outlet or body. Use conduit bodies to make sharp changes in direction (as around beams). Use hydraulic one-shot bender to fabricate bends in metal conduit larger than two inch (2") size. All conduit shall be held right to structure.
- I. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- J. No continuous section of conduit may exceed 100 feet. Utilize pull boxes as necessary. Refer to the pull box execution section for more information.
- K. Exterior rooftop pathways shall be supported above roofing membrane utilizing rubber type support bases with 12 ga. galvanized channel supports (Copper B-Line Dura-Block or equivalent). Adjust height as necessary for compliance with NEC.

3.02 BOX INSTALLATION

- A. Install boxes in accordance with NECA "Standard of Installation."
- B. Maintain headroom and present neat mechanical appearance.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Junction boxes shall not be installed over four foot (4') above accessible ceilings.
- D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than six inches (6") from ceiling access panel or from removable recessed luminaire.
- E. Fire-stop boxes to preserve fire resistance rating of partitions and other elements. Boxes may be installed within a minimum of 24 inch separation with written approval prior to installation.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit using materials and method to preserve fire resistance rating of partitions and other elements.
- B. Piping and Ductwork: Route conduits through roof openings or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified.
- C. Coordinate installation of outlet and junction boxes for equipment connection.

3.04 ADJUSTING

- A. Install knockout closures in unused box openings.

3.05 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.

- B. Clean exposed surfaces and restore finish.

END OF SECTION 26 0533

SECTION 26 0553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates and labels
- B. Wire markers
- C. Conduit markers
- D. Identification

1.02 REFERENCES

- A. NFPA 70 - National Electrical Code
- B. NFPA 70E - Standard for Electrical Safety in the Workplace

1.03 SUBMITTALS

- A. Product Data: Provide catalog data for nameplates, labels and markers.
- B. Samples: Submit two nameplates 4" x 4" in size illustrating materials and engraving quality.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 NAMEPLATES AND LABELS

- A. Nameplates:
 - 1. Normal power: Engraved three-layer laminated plastic white letters on black background.
 - 2. Emergency power: Engraved three-layer laminated plastic white letters on red background.
- B. Locations:
 - 1. All electrical distribution and control equipment enclosure.
 - a. Switchboards and Panelboards: Line 1 shall state "Panel Name"; Line 2 shall state "Fed by Panel Name" as required by NEC section 408.4(B).
 - 2. Single mounted breaker.
 - 3. Transfer switch.
 - 4. Fire alarm devices.
- C. Letter Size:
 - 1. Use 1/8 inch letters for identifying individual equipment and loads.
 - 2. Use 1/4 inch letters for identifying grouped equipment and loads.
 - 3. Use 1/4 inch letters for identifying communications cabinets, transfer switches and transformers.
- D. Labels: Embossed adhesive tape with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations, and communication outlets.

2.02 WIRE MARKERS

- A. Description: Tape feeders to indicate phases.
 - 1. Marker colors for 277/480V shall be as follows: phase A shall be brown, phase B shall be yellow, and phase C shall be orange.
 - 2. Marker colors for 120/208V shall be as follows: phase A shall be black, phase B shall be red, and phase C shall be blue.

- B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
- C. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number indicated.
 - 2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams.

2.03 CONDUIT MARKERS

- A. Location: Mark conduit longer than 20 feet.
- B. Spacing: 30 feet on center.
- C. Color:
 - 1. 480 Volt System: Orange
 - 2. 208 Volt System: Black
 - 3. Fire Alarm System: Red
 - 4. Other Systems: Green
- D. Legend:
 - 1. 480 Volt System: H- (name of feeder)
 - 2. 208 Volt System: L- (name of feeder)
 - 3. Fire Alarm System: FA
 - 4. Telephone System: TS
 - 5. Computer System: CS

2.04 IDENTIFICATION

- A. Identify All Junction Boxes With Appropriate Marker As Follows:
 - 1. 480 Volt System: Orange (circuit name and number)
 - 2. 208 Volt System: Black (circuit name and number)
- B. Write the circuit number of each device inside the device box (not ON the device cover). Coordinate exact requirements with the owner prior to installation.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

3.02 INSTALLATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws.
- C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.
- D. Identify conduit using field painting.
- E. Paint colored band on each conduit longer than 6 feet.
- F. Paint bands 20 foot on center.

END OF SECTION 26 0553

SECTION 26 2726 WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ground fault circuit interrupting receptacles
- B. Emergency pushbutton
- C. General purpose contactor

1.02 RELATED REQUIREMENTS

- A. Specification Section 26 0533 - Raceway and Boxes for Electrical Systems

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2010
- B. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005)
- C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R 2008)
- D. NFPA 70 - National Electrical Code; National Fire Protection Association; 2011
- E. UL Standard 943 - Standard for Safety for Ground-Fault Circuit Interrupters (GFCIs)

1.04 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Products: Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLES

- A. Receptacles: Complying with NEMA WD 6 and WD 1. Class A GFCI rated.
 - 1. Style: Hard use specification grade
 - 2. Device Body: Impact resistant plastic with impact-resistant nylon face. Auto-grounding strap.
 - 3. Configuration: NEMA WD 6, type as specified and indicated.
 - 4. Rating: Match branch circuit and load characteristics. Default rating is 5-20R, 125V, 20A.
 - 5. Standards: Receptacles comply with NEMA WD 6 and WD 1.
 - 6. Wiring: Back and side wire connections. Accepts #14-#10 AWG solid and stranded copper conductors.
 - 7. Provide #12 AWG solid pigtails at each device. Splice to building wire within outlet box.
 - 8. Color: Selected during submittal phase. Provide color chart upon request.
- B. Types
 - 1. GFCI Duplex Receptacles
 - a. Manufacturers:
 - 1) Pass & Seymour #2097
 - 2) Cooper SGF20
 - 3) Hubbell GFRST20
 - 4) Leviton GFNT2

- b. Description: Specification grade duplex GFCI receptacle.
- c. Receptacles noted as "GFI" on plans.

2.02 EMERGENCY PUSHBUTTON: EXTERIOR APPLICATIONS

- A. Yellow indoor/outdoor surface mount turn to reset stopper station with red pushbutton assembly, 120/240V rated, 1 NO + 1NC contact, ADA compliant, with clear polycarbonate cover suitable for -40 to 250 degrees Fahrenheit, and stainless steel backplate. Provide engraved nameplate above pushbutton that shall read: EMERGENCY POWER OFF.
 - 1. Manufacturers:
 - a. STI SS2271PO-EN
 - b. Engineer approved equal.

2.03 EMERGENCY PUSHBUTTON: INTERIOR APPLICATIONS, AESTHETICALLY PLEASING

- A. Red flush complete illuminated LED pushbutton assembly, 120V rated, 1 NO + 1NC contact, aluminum drilled front plate with fixing screws, and empty flush mounted protective box. Provide engraved nameplate above pushbutton that shall read: EMERGENCY POWER OFF.
 - 1. Manufacturers:
 - a. Square D XB4BW34G5 - Assembly, XAPE301 - Cover, XAPE901 - Box.
 - b. Cutler Hammer
 - c. Siemens
 - d. Engineer approved equal.

2.04 GENERAL PURPOSE CONTACTOR

- A. Contactors: NEMA ICS 2 and UL 508; electrically held, 30 amps rated.
- B. Coil Operating Voltage: 120 volts, 60 Hertz.
- C. Poles: 6, Normally closed.
- D. Enclosure: ANSI/NEMA ICS 6; NEMA Type 1.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that outlet and switch boxes are installed at proper height.
- B. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.02 PREPARATION

- A. Provide extension rings as needed to bring outlet and switch boxes flush with finished surface.
- B. Clean debris from outlet and switch boxes prior to device installation.

3.03 INSTALLATION

- A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.
- B. Install devices plumb and level.
- C. Connect wiring device grounding terminal to outlet box with bonding jumper.
- D. Connect wiring devices by wrapping conductor around screw terminal.
- E. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- F. The feeding of receptacles downstream of GFI receptacles for protection in lieu of providing multiple GFI receptacles is NOT allowed.

3.04 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Verify that each receptacle device is energized.
- C. Test each receptacle device for proper polarity.

D. Test each GFCI receptacle device for proper operation.

3.05 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION 26 2726

SECTION 26 2816

ENCLOSED STARTERS AND SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Safety switches

1.02 RELATED REQUIREMENTS

- A. Specification Section 26 0529 - Hangers and Supports for Electrical Systems
- B. Specification Section 26 0553 - Identification for Electrical Systems

1.03 REFERENCE STANDARDS

- A. NEMA FU 1 - Low Voltage Cartridge Fuses; National Electrical Manufacturers Association
- B. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association
- C. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association
- D. NFPA 70 - National Electrical Code; National Fire Protection Association
- E. NECA - Standard of Installation (published by the National Electrical Contractors Association)

1.04 SUBMITTALS

- A. Project Record Documents: Record actual locations of enclosed switches.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.
- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 SAFETY SWITCHES

- A. Manufacturers
 - 1. Square D
 - 2. General Electric
 - 3. Eaton
 - 4. Siemens
 - 5. Engineer approved equal.
- B. Heavy duty safety switches shall be used for all motor loads over 1 HP and all non-motor loads 20 amps and greater.
 - 1. Fusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
 - a. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
 - b. Handle lockable in OFF position.
 - c. Fuse clips: Designed to accommodate NEMA FU1, Class R fuses, with rejection clips designed to permit installation of Class R fuses only.
 - d. Indicated as a disconnect switch with a "F" on the drawings.
 - 2. Nonfusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
 - a. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
 - b. Handle lockable in OFF position.

3. Enclosures: NEMA KS 1.
 - a. Interior Dry Locations: Type 1 .
 - b. Exterior Locations: Type 3R.
 - c. Enclosures shall be provided with a method of opening the cover without opening the switch.
4. Enclosure shall include a grounding bar.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with NECA "Standard of Installation."
- B. Install in accordance with manufacturer's instructions.
- C. Install plumb and provide in accordance with Specification Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Height to be five foot (5') to operating handle.
- E. Provide adhesive label with white letters on black background for associated equipment.
- F. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.02 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA STD ATS, except Section 4.
- B. Perform inspections and tests listed in NETA STD ATS, Section 7.5.1.2.

END OF SECTION 26 2816

SECTION 26 9000 PHOTOVOLTAIC SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Photovoltaic modules
- B. Mounting for photovoltaic modules (Ballasted racking system)
- C. Wiring for photovoltaic modules
- D. Grid-tie Inverters
- E. Combiner boxes
- F. DC optimizers

1.02 SECTION INTENT

- A. The intent of this section is to establish the minimum requirements for the installation of the photovoltaic panels shown on the plans.
- B. Power, cable and raceway installation required for this system will be installed as indicated elsewhere in the electrical specifications, unless stated otherwise in this section.

1.03 RELATED SECTIONS

- A. Specification Section 26 0519 – Electrical Power conductors and Cables
- B. Specification Section 26 0526 – Grounding and Bonding for Electrical System
- C. Specification Section 26 0533 – Raceway and Boxes for Electrical Systems
- D. Specification Section 26 0553 – Identification for Electrical Systems
- E. Specification Section 26 2816 – Enclosed Switches

1.04 REFERENCES

- A. NECA Standard of Installation (published by the National Electrical Contractors Association)
- B. NFPA 70 – National Electric Code
 - 1. Article 690 – Solar Photovoltaic (PV) Systems
- C. UL Listing: All material and equipment shall be listed, label, or certified by Underwriters Laboratories, Inc. All power supplies and computers shall be UL listed. Provide UL listing cards for all components specified herein. Install all equipment in compliance with applicable NEC and IEEE recommendations and procedures.

1.05 SUBMITTALS

- A. Product Data: Provide catalog data for all materials and components unless submitted elsewhere in this specification.
- B. Samples: Submit samples of mounting hardware as requested by Design Team.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
 - 1. Include system average weight per squarefoot.
- D. System Layout: Provide system layout with panel angles identified as well as circuiting groups appropriate for the power conversion equipment.
- E. Submit cut sheet, detailed system riser diagram, all wire, devices, and provide written confirmation from the factory that they are an authorized representative for the submitted product. This document shall be included as part of the submittal data.
- F. Provide complete brochure information on all components and accessory equipment. All information shall be clearly marked to indicate items provided.

1.06 PROJECT CONDITIONS

- A. It is the intent of these specifications and the accompanying plans that the contractor furnishes and installs a system complete in every respect and ready to operate. Unless otherwise noted, all miscellaneous items and accessories required for such installation whether or not each such item or accessory is shown on the drawings or mentioned in these specifications shall be furnished and installed.
- B. Verify that field measurements are as depicted on the drawings. Wire routing shown on drawings is approximate unless dimensioned. Route wire as required to meet project conditions. Where wire routing is not shown and destination only is indicated, determines exact routing and lengths required.
- C. Support wires as specified elsewhere in this specification.

1.07 TECHNOLOGY OBSOLESCENCE

- A. The customer reserves the right with vendor approval, to modify the list of equipment based on equipment available at time of installation in order to guard against technology obsolescence

1.08 BIDDING INFORMATION

- A. Refer to general conditions in architectural portion of specification. The electrical contractor (responsible for Division 26) shall include in their base bid a complete Photovoltaic Renewable Energy solution, installed and provided by an approved bidder.

1.09 WORK INCLUDED

- A. Permits:
 - 1. The electrical contractor is responsible for producing and providing any documentation for obtaining permits necessary and all expenses associated with the permitting process required by local AHJ and State Fire Marshal.
 - 2. Contractor shall coordinate with local utility for net metering requirements.

PART 2 PRODUCTS

2.01 PHOTOVOLTAIC MODULES

- A. Basis of Design:
 - 1. Silfab
- B. Key Features:
 - 1. Monocrystalline or Polycrystalline type, minimum 600V maximum system voltage. +/- 3% module tolerance power rating measurement.
 - 2. Minimum power of 390W +/- 5% under Standard Test Conditions
 - 3. Dimensions: Compatible with space available.
 - 4. Electrical Connection: Series wiring configuration of junction box, carrying IP65 rating. Cable shall be adequate for wiring between modules.
 - 5. Operating Module Temperature: Capable of generating power at -20 deg F to +115 deg F.
 - 6. Listing: UL1703
 - 7. Warranty: 10 Year guaranty to exhibit 90% of original minimum rated power, 20 year guaranty to exhibit 80% of original minimum rated power.
 - 8. Refer to quantity on plans. Note that this is subject to an alternate bid for reduction of modules with same total KW performance. Refer to plans for KW size.
 - 9. Hail and wind resistant.

2.02 MOUNTING FOR PHOTOVOLTAIC MODULES (BALLASTED RACKING SYSTEM)

- A. Manufacturers:
 - 1. DynoRaxx Evolution FR
 - 2. DPW Power-Fab
 - 3. UniRac
 - 4. Everest
 - 5. Panel Claw
 - 6. Engineer approved equal.

B. Construction and Performance

1. Material: Fiberglass ballast baskets with 10 deg tilt or aluminum rails with adjustable tilt legs.
2. Mounting Hardware: Galvanized Steel rails and stainless steel pins.
3. Configuration: Refer to plans for module layout.
4. Provide all necessary concrete ballast blocks for code compliant installation. Total system installation shall be able to withstand 90 mph winds (refer to local codes for higher wind velocity requirements).
5. Provide a divorcing sheet to separate the ballast rack and the roof membrane. Divorce sheet shall be compatible with the roof membrane. Coordinate with the general contractor.
- 6.

C. Installation Notes:

1. Refer to architectural roof plan for the slope of the roof. Install racking system along the same elevation lines for a level appearance.
2. Do not install any panels or racks within ten feet of the roof edge.

2.03 WIRING FOR PHOTOVOLTAIC MODULES

A. Installation Notes:

1. All work shall be done in accordance with local applicable codes.
2. Wiring shall be designed to achieve no more than 3% voltage drop between module and inverters.
3. Provide DC disconnects for each string (when there are greater than 2 strings) of modules after or integral to the combiner box between inverter and modules.
4. Provide AC disconnect between inverter and [Supply Side] [Load Side] connection. Coordinate exact locations with Utility and authority having jurisdiction.
5. At end of string, transition from module wiring whips to metallic conduit and building wire in sealed junction box.
6. All conduit shall be routed on top of roof on top of Erico Caddy Pyramid 25 or equivalent roof conduit supports.
7. Submittal drawings shall include complete wiring diagram including conduit size, proposed routing, wire count and configuration, and roof connection points for approval.
8. Provide rapid shutdown per NEC 690.12.

2.04 GRID TIE INVERTERS

A. Basis of Design:

1. Solar Edge

B. Key Features:

1. Capable of output power to match system size (refer to plans) nominal power output at 3 phase 480 96.0% efficiency
2. Total harmonic distortion of <3%.
3. Power factor shall be unity (1.0).
4. Standby consumption (night time) shall be less than 1W. Operational consumption shall be less than 22W.
5. Shall have integral ventilation fan.
6. Device shall have UL 1741 certification.
7. Anti-islanding functionality.
8. Pure Sine-wave output.
9. MPPT (Maximum Power Point Tracking).
10. Integral Ground fault detection.
11. Input voltage minimum of 600VDC compatible.
12. Arc Fault protections shall be provided either integral to inverter or combiner box.

C. Monitoring and Communication Capabilities:

1. Building Automation System: Inverter shall have capabilities to communicate to the BAS via the Modbus or BacNet protocol. Provide the inverter manufacturer's points lists for the BAS contractor.
2. Web Based Monitoring: The inverter shall contain a web-based monitoring server that allows for remote PC monitoring by the owner.

D. Warranty: 10 year warranty against defective product.

2.05 COMBINER BOXES

- A. Basis of Design:
 1. Solar BOS
 2. Shoals
 3. Cooper
 4. Engineer approved equal.
- B. Key Features:
 1. Minimum 600VDC voltage rating
 2. UL 1741 listed
 3. Reinforced, plated busbars
 4. NEMA 4 or 4X enclosure rating.
 5. Warranty: 5-year standard warranty.
 6. Arc Fault protections shall be provided either integral to inverter or combiner box.

2.06 DC OPTIMIZERS

- A. Basis of Design:
 1. Solar Edge
 2. Alencom
 3. Engineer approved equal.
- B. Key Features:
 1. MPPT
 2. Weighted efficiency 98.5%
 3. module level voltage shutdown
 4. Module level monitoring
 5. Arc fault compliant
 6. Rapid shut down compliant
 7. UL1741
 8. 600VDC compatible
 9. IP68
- C. Monitoring and Communication Capabilities:
 1. Building Automation System: Inverter shall have capabilities to communicate to the BAS via the Modbus or BacNet protocol. Provide the inverter manufacturer's points lists for the BAS contractor.
 2. Web Based Monitoring: The inverter shall contain a web-based monitoring server that allows for remote PC monitoring by the owner.
- D. Warranty: 10 year warranty against defective product.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install system in accordance with manufacturer's instructions.
- B. Provide all system grounding and bonding required by the NEC including connections to supports.

3.02 ACCEPTANCE TESTING

- A. The Following Testing Will Be Done in Order to Insure a Fully Functional System.
 1. Demonstrate operation of all modules producing power.
 2. Verification testing of inverters.

3.03 TRAINING

- A. The vendor will provide a minimum of one-day (6 hours) of hands-on training for customer staff to cover connecting, monitoring, and troubleshooting of the installed equipment.

3.04 DOCUMENTATION

- A. The contractors shall provide three full documentation sets to the owner for approval upon completion of the installation. Documentation shall include the items detailed in the sub-sections above.
- B. Documentation shall be submitted within ten working days of the completion of each testing phase. This is inclusive of draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within thirty working days of the completion of installation.
- C. All documentation, including hard copy and electronic forms shall become the property of the owner.

3.05 WARRANTY

- A. The bidder shall warrant the entire PV system (equipment and components) to be free from defect in materials and workmanship, under normal use and service for a period of one-year from the date of acceptance. The warranty shall cover 100% of labor and transportation cost for replacement. The bidder should include all costs associated with this warranty.

END OF SECTION 26 9000

