

Andrew Tissue

From: Andrew Tissue
Sent: Friday, July 30, 2021 11:12 AM
To: ALLEN, DOUGLAS K JR CTR USAF HAF SAF/SAF/IEI; FLANDERS, JAMIE A GS-13 USAF ANG NGB/A2/3/6/10TA; MADERO, STEVE GS-13 USAF ANG NGB/A2/3/6Y; MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA; Lignowski, Michael J CTR OSD OUSD A-S (USA)
Cc: MCPHEE, DUNCAN J Maj USAF ANG 120 FS/DOV; MILLER, DAVID D CTR USAF ANG MICRTC/A2/3/6/10 TA; JONES, LANDON R III GS-13 USAF ANG NGB/A236YR; atibbs@auroragov.org; BEARD, ROBBIN E CTR HAF SAF/IEI; douglas.allen-2@leidos.com
Subject: RE: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

All,

Thanks for your help on this.

We've reviewed the email thread below as well as the [FAQs](#) and spoke with Doug a moment ago, and will email the necessary info / documents to the email address listed in the FAQs (osd.dod-siting-clearinghouse@mail.mil) for it to be distributed from there.

Regards,

Andrew M Tissue AIA, WELL AP, LEED Green Associate
Associate

Direct: 612 379 5536 | Cell: 612 244 1071 | atissue@cunningham.com
[LICENSURE AND REGISTRATIONS ON OUR WEBSITE](#)

Cunningham
201 SE Main Street, Suite 325
Minneapolis, Minnesota 55414
cunningham.com

Update on our office reopening

From: ALLEN, DOUGLAS K JR CTR USAF HAF SAF/SAF/IEI <douglas.allen.5.ctr@us.af.mil>
Sent: Friday, July 30, 2021 10:21 AM
To: FLANDERS, JAMIE A GS-13 USAF ANG NGB/A2/3/6/10TA <jamie.flanders.2@us.af.mil>; MADERO, STEVE GS-13 USAF ANG NGB/A2/3/6Y <steve.madero@us.af.mil>; MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA <peter.mendoza.2@us.af.mil>; Andrew Tissue <atissue@cunningham.com>; Lignowski, Michael J CTR OSD OUSD A-S (USA) <michael.j.lignowski.ctr@mail.mil>
Cc: MCPHEE, DUNCAN J Maj USAF ANG 120 FS/DOV <duncan.mcphee.3@us.af.mil>; MILLER, DAVID D CTR USAF ANG MICRTC/A2/3/6/10 TA <david.miller.202.ctr@us.af.mil>; JONES, LANDON R III GS-13 USAF ANG NGB/A236YR <landon.jones.3@us.af.mil>; atibbs@auroragov.org; BEARD, ROBBIN E CTR HAF SAF/IEI <robbin.beard.ctr@us.af.mil>; douglas.allen-2@leidos.com
Subject: RE: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

Thanks Jamie

Aja – I recommend submitting this project to the DoD Siting Clearinghouse for an Informal Review. You can find the step by step instructions on how to submit an Informal Review on the Clearinghouse's FAQ site here (<https://www.acq.osd.mil/dodsc/about/faq.html>) under the header "How do you request an informal review and what information is needed?".

Submitting the project in this way will ensure we have all the info and data we need to run the assessments Jamie mentioned below, and will ensure all the DoD Services get a look so you don't get any last minute surprises.

If you want to give me a call to explain further or answer any questions, feel free to call me at 804.201.0561.

Thanks,

Doug Allen, AICP, PMP
SAF/IEI Mission Sustainment Analyst, Ctr
Douglas.Allen.5.ctr@us.af.mil
m: (804) 201-0561

Important Note: *I have recently transitioned to Cloud Hosted Enterprise Services. Please update your email address for me to point to douglas.allen.5.ctr@us.af.mil*

From: FLANDERS, JAMIE A GS-13 USAF ANG NGB/A2/3/6/10TA <jamie.flanders.2@us.af.mil>
Sent: Friday, July 30, 2021 9:34 AM
To: MADERO, STEVE GS-13 USAF ANG NGB/A2/3/6Y <steve.madero@us.af.mil>; MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA <peter.mendoza.2@us.af.mil>; atisue@cunningham.com
Cc: MCPHEE, DUNCAN J Maj USAF ANG 120 FS/DOV <duncan.mcphee.3@us.af.mil>; MILLER, DAVID D CTR USAF ANG MICRTC/A2/3/6/10 TA <david.miller.202.ctr@us.af.mil>; JONES, LONDON R III GS-13 USAF ANG NGB/A236YR <london.jones.3@us.af.mil>; ALLEN, DOUGLAS K JR CTR USAF HAF SAF/SAF/IEI <douglas.allen.5.ctr@us.af.mil>; atibbs@auroragov.org; BEARD, ROBBIN E CTR HAF SAF/IEI <robbin.beard.ctr@us.af.mil>
Subject: RE: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

Thank you Steve,

To our Buckley and CO folks. When it comes to alternative energy projects like this and coordinating with the DoD agencies, the best first step is to send a request for an informal review to the OSD Clearinghouse. Your POCs for that are Ms. Beard and Mr. Allen (cc'd). They will ensure the right smart people look at your project to determine if there is any need for further coordination with the DoD. If the answer is no, you're all clear with us. If the answer is yes, we'll figure out what the issues are and any ways we can compromise to still allow the project.

That said – a little quick solar 101. From the attached white paper, the DoD has determined there are some potential impacts with solar projects that are constructed on or near DoD facilities or airspace. Those are:

- clutter impacts to ground-based radar
- clutter impacts to airborne radar
- radio frequency interference
- glint/glare on photo sensors including eyes

These are the things the before-mentioned smart people will look at during the informal review. And, these are easily mitigatable. Solar panels are installed around airports in a lot of locations. In fact, isn't there a large solar array right next to Denver International?

I would recommend the developer consider providing a glare/glint analysis as part of their presentation to the OSD Clearinghouse. I anticipate that will be our biggest concern.

v/r

Jamie

JAMIE A. FLANDERS, GS-13, DAF
Airspace Manager, NGB/A2/3/6/10TA
DSN 612-9253; Comm: 240-612-9253 (Tues, Thurs, Fri only)
Cell: 682-472-2185 (Mon, Wed only)

From: MADERO, STEVE GS-13 USAF ANG NGB/A2/3/6Y <steve.madero@us.af.mil>
Sent: Thursday, July 29, 2021 6:16 PM
To: MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA <peter.mendoza.2@us.af.mil>
Cc: SPRINGER, KARL G GS-12 USAF ANG ANGRC/A2/3/6/10 <karl.springer@us.af.mil>; FLANDERS, JAMIE A GS-13 USAF ANG NGB/A2/3/6/10TA <jamie.flanders.2@us.af.mil>
Subject: RE: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

Peter,

I have no experience in glare/glint issues, as TERPS is not responsible for conducting glare/glint evaluations, but Mr. Jamie Flanders (CC'ed) might be able to assist you. Talking with Jamie, he has indicated, in the past, that the DoD did have issues with solar panels near or on bases and that there is a software tool that will help in determining if there is a glare/glint issues from Solar Farms / Solar Panels.

The attached info might be useful when chatting with Mr. Flanders. If he's not able to assist you, he might be able to point you in the right direction.

V/R

Steve Madero

Steve Madero, GS-13, DAF
Chief, Airfield Operations Branch
NGB/A2/3/6/10YO

 - DSN 612-9258

 - Commercial (240) 612-9258

 - Cell: (571) 344-2887

Email: steve.madero@us.af.mil

Org Box Email: NGB.A21YO-A3A.AIRFIELD-OPERATIONS@us.af.mil

This e-mail may contain For Official Use Only (FOUO) information that may be exempt under the Freedom of Information Act, 5 United States Code (U.S.C.) 552 and must be protected under the Privacy Act and AFI 33-332.

From: MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA <peter.mendoza.2@us.af.mil>
Sent: Thursday, July 29, 2021 4:35 PM
To: MADERO, STEVE GS-13 USAF ANG NGB/A2/3/6Y <steve.madero@us.af.mil>; SPRINGER, KARL G GS-12 USAF ANG ANGRC/A2/3/6/10 <karl.springer@us.af.mil>
Subject: FW: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

Steve,

Please read below about the glare/reflectivity concerns and let us know if there is an issue since this project is so close to the base. Thanks.

Pete Mendoza, GS-11, SMSgt (Ret)
140 OSS, Assistant Airfield Manager

Buckley Garrison, CO 80011
DSN: 847-6352
COMM: 720-847-6352
Peter.mendoza.2@us.af.mil

From: INGRUM, ROBERT P III GS-12 USAF SPOC 460 CES/CEN <robert.ingrum@spaceforce.mil>
Sent: Thursday, July 29, 2021 10:53 AM
To: ARAGON, LAWRENCE R GS-12 USAF ANG 140 OSS/OSA <lawrence.aragon.1@us.af.mil>; MENDOZA, PETER GS-11 USAF ANG 140 OG/OSA <peter.mendoza.2@us.af.mil>
Subject: FW: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

L.A. and Peter,

This is a referral for a solar roof canopy project for Aurora Public Schools. It's the parking lot just south of 160 N. Airport blvd. The address is just south of the APZ II. The canopies and solar panels would cover about 200, 000 sq. ft. or 4.5 acres. They panels will be fixed..not rotating. -Porter



From: Andrew Tisue <atisue@cunningham.com>
Sent: Wednesday, July 28, 2021 10:18 AM
To: INGRUM, ROBERT P III GS-12 USAF SPOC 460 CES/CEN <robert.ingrum@spaceforce.mil>
Cc: Alan Doggett <adoggett@cunningham.com>; Todd VandenBurg <tVandenBurg@cunningham.com>; Morgan Young <myoung@cunningham.com>; Lanning, Roark <Roark.Lanning@wsp.com>
Subject: [Non-DoD Source] Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info

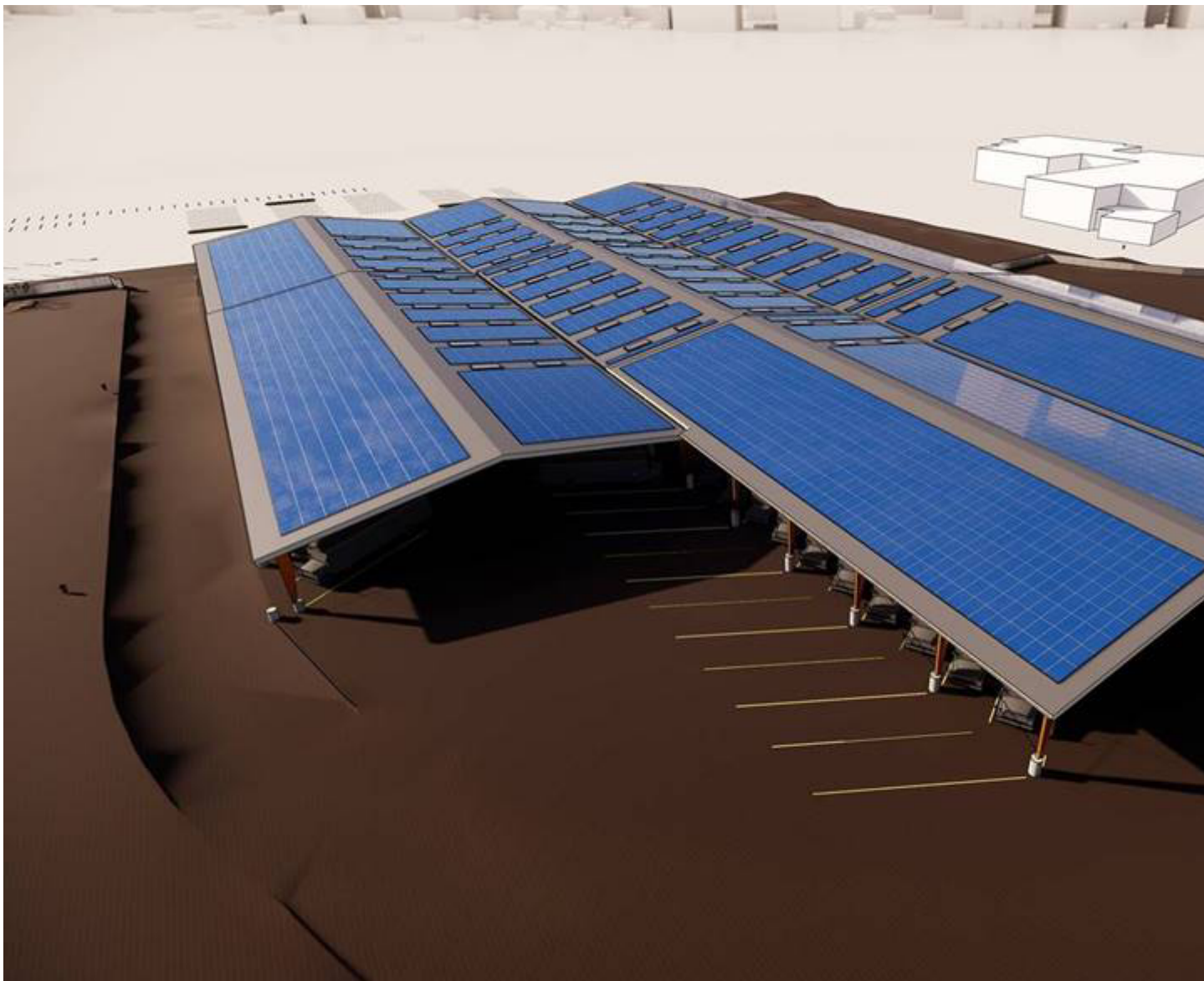
Hi Porter,

I'm an architect working with Aurora Public Schools on a project to protect the school's fleet of ~180 school buses with a roof canopy over their existing parking lot that will also host PV panels – see rendering below. The location of the project is 160 Airport Blvd.

The city has shared your contact info with us in order to ask about glare/reflectivity concerns with the PV panels' proximity to the Airforce base. Are there specs / criteria available that we ought to be aware of as we work through the design of the PV system and selection of panels?

Please give me a call to discuss at your earliest convenience.





Regards,

Andrew M Tissue AIA, WELL AP, LEED Green Associate
Associate

Direct: 612 379 5536 | Cell: 612 244 1071 | atisue@cunningham.com

[LICENSURE AND REGISTRATIONS ON OUR WEBSITE](#)

Cunningham

201 SE Main Street, Suite 325
Minneapolis, Minnesota 55414
cunningham.com

Update on our office reopening

From: Tibbs, Aja <atibbs@auroragov.org>

Sent: Wednesday, July 28, 2021 10:20 AM

To: Andrew Tissue <atisue@cunningham.com>

Subject: Buckley AFB Contact Info

Good Morning Andrew,

Our referral contact for projects related to the Buckley Airforce Base is Porter Ingram. I don't have his phone number listed, but his email is Robert.ingrum@us.af.mil. Please feel free to reach out.

Aja Tibbs

Preferred pronouns: she, her, hers

Planner II | Planning and Development Services | City of Aurora

office 303.739.7227



[Facebook](#) | [Twitter](#) | [Instagram](#) | [Nextdoor](#) | [AuroraTV.org](#)

Andrew Tisue

From: Andrew Tisue
Sent: Friday, July 30, 2021 12:02 PM
To: osd.dod-siting-clearinghouse@mail.mil
Subject: Informal review request - Aurora Public Schools Bus Canopy - roof with solar panels
Attachments: RE: Aurora Public Schools Bus Canopy - FW: Buckley AFB Contact Info; SolarPanelSpecs.pdf; APS-BusCanopy_drawings.pdf

Hello Clearinghouse,

We are submitting the following information requested for evaluation of roof-mounted solar panels near Buckley AFB.

Contact Information

Owner / Client:

Aurora Public Schools
Fred Boening
1369 Airport Blvd
Aurora, CO 80011
fjboening@aurorak12.org
(720) 584-8057

Architect / Consultant / Project Point-of-Contact

Cunningham
Andrew Tisue
1500 Wynkoop Street, Suite 300
Denver, CO 80202
atisue@cunningham.com
(612) 379-5536 | office
(612) 379-4400 | fax

Geographic Location

The address of the project for the purposes of documentation is 160 Airport Blvd, Aurora, CO 80011.

The location of the proposed construction is the parking lot just to the southeast of this address, shown in the screenshot below.

The coordinates of the proposed construction are:

39°43'2.89"N
104°47'21.52"W

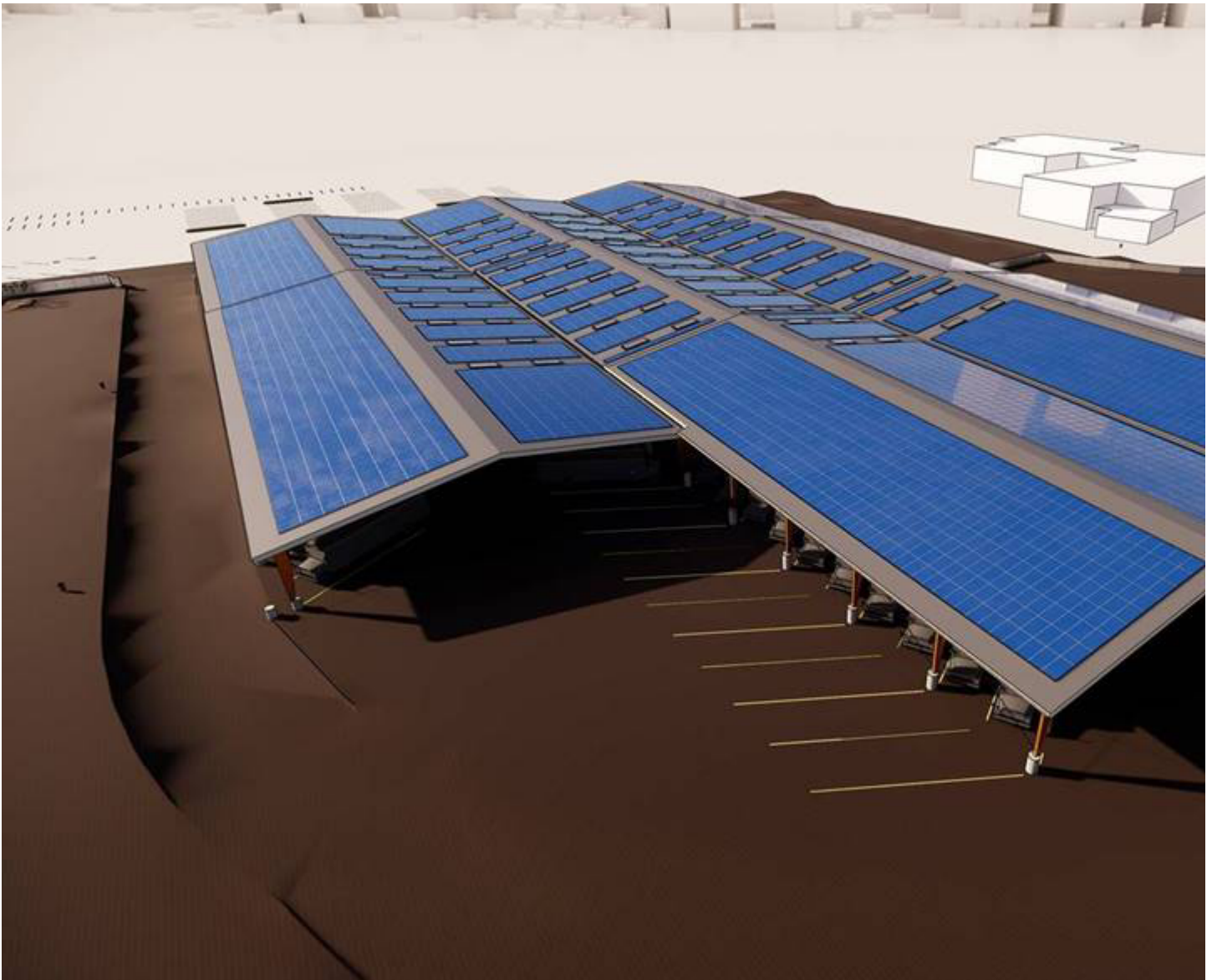


Nature of the Project

The purpose of this project is to protect Aurora Public School's fleet of ~180 school bus from the elements when they're parked, primarily seasonal hail storms, as well as their school bus drivers.

A ~200,000sf open-air roof canopy is proposed to be constructed over the existing bus parking lot providing protection. The school district is also pursuing the installation of a large fixed solar panel array atop this new roof canopy. See the attached drawings for information on the height, slope, and area of the proposed panels, as well as the current basis-of-design of the panel modules themselves.

We are requesting assistance with a glare analysis to understand what, if any mitigation strategies may need to be incorporated as the design of the solar panel system evolves.



Regards,

Andrew M Tissue AIA, WELL AP, LEED Green Associate
Associate

Direct: 612 379 5536 | Cell: 612 244 1071 | atissue@cunningham.com

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Cunningham

201 SE Main Street, Suite 325
Minneapolis, Minnesota 55414
cunningham.com

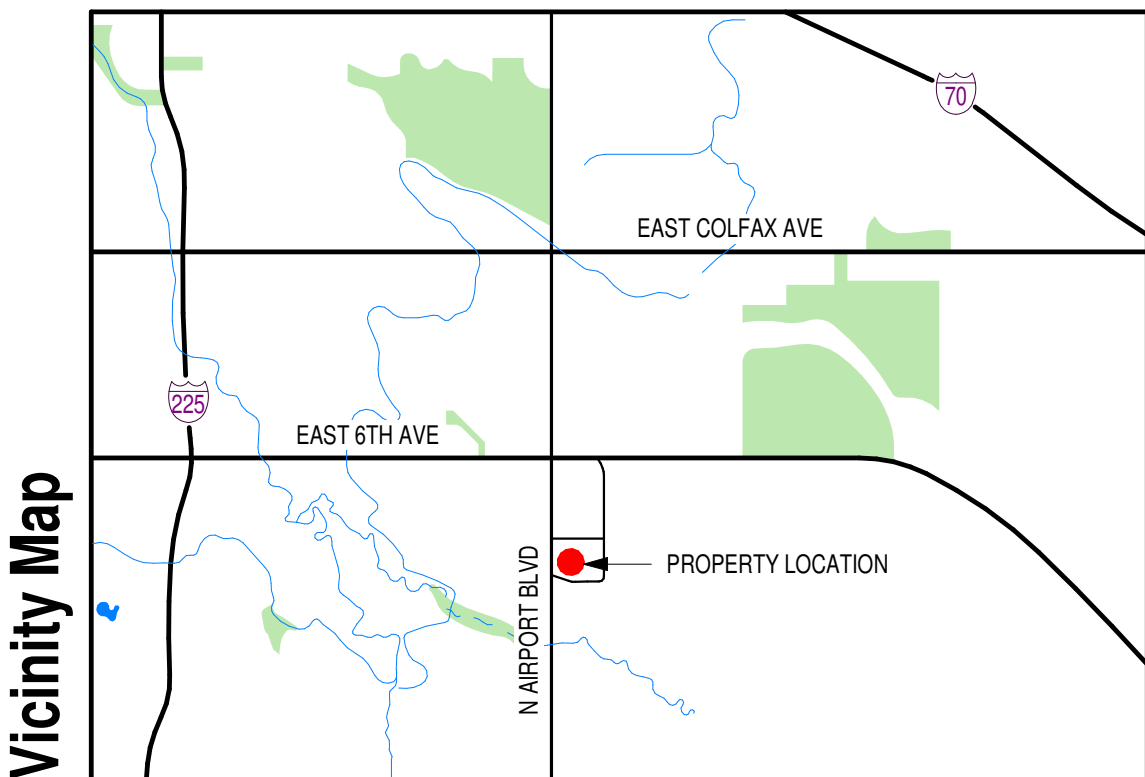
Update on our office reopening



Project Image

AURORA PUBLIC SCHOOLS BUS CANOPY

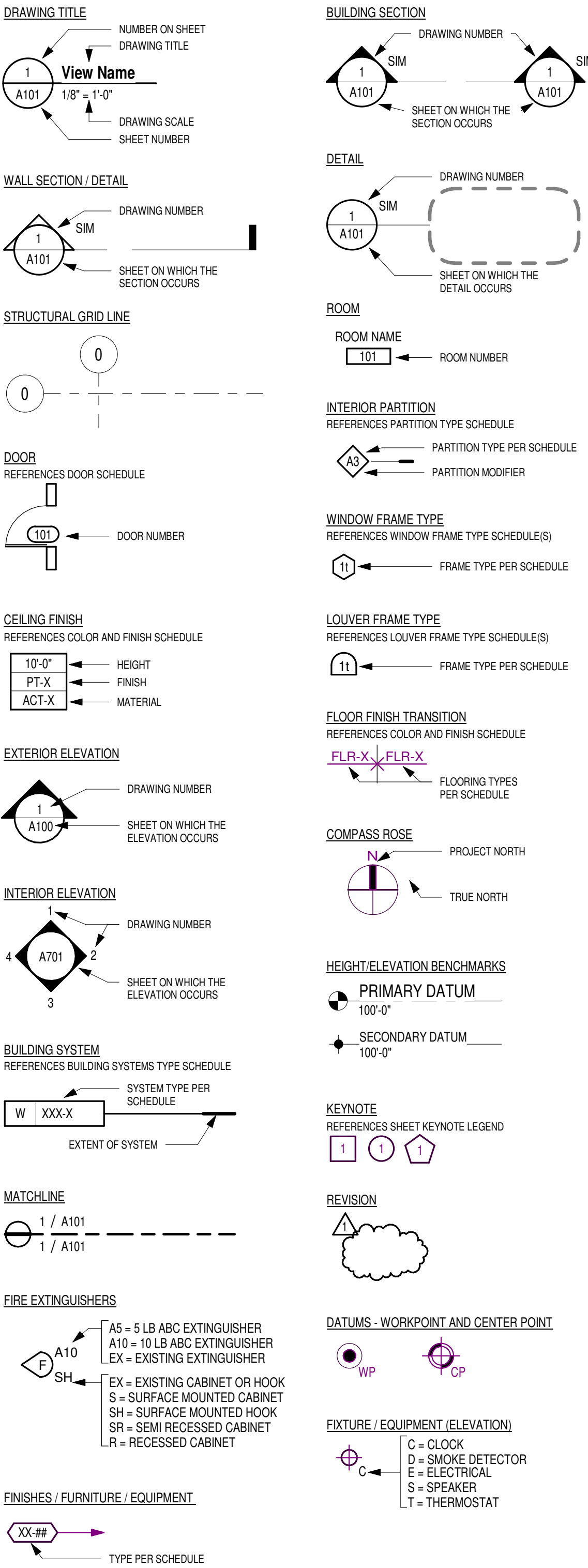
160 NORTH AIRPORT BOULEVARD AURORA, COLORADO 80011



Contacts

Owner		Architect		Civil Engineer	
Name:	Aurora Public Schools	Name:	Cunningham	Name:	JVA, Inc.
Contact:	Frederick Boening	Contact:	Andrew Tisue	Contact:	Ty Parker
Address:		Address:	201 SE Main Street Suite 325 Minneapolis, MN 55414	Address:	1512 Lathmer Street Suite 710 Denver, CO 80202
Phone:	(720) 584-8057	Phone:	(612) 379-5536	Phone:	(303) 565-4907
E-Mail:	fboening@aurora.k12.or.gov	E-Mail:	atisue@cunningham.com	E-Mail:	tparker@jva.com
Structural Engineer		Electrical Engineer			
Name:	KL&A Engineers and Builders	Name:	WSP		
Contact:	Heath C. Stein	Contact:	Roark Lanning		
Address:	1717 Washington Ave Golden, CO 80401	Address:	4840 Pearl East Circle Suite 300W Boulder, CO 80301		
Phone:	(303) 384-9910	Phone:	(303) 390-5949		
E-Mail:	hstein@kla.com	E-Mail:	roark.lanning@wsp.com		

Graphic Symbols



Abbreviations

AB AIR BARRIER AC ACCESSORY ACA ACOUSTICAL CEILING ACCESSORY AGS ACOUSTICAL CEILING GRID ACP ACOUSTICAL CEILING PANEL ACR ACRYLIC ACT ACOUSTICAL CEILING TILE ADA AMERICANS WITH DISABILITIES ACT ADH ADHERE AF ACCESS FLOOR AFF ABOVE FINISHED FLOOR ALT ALTERNATIVE / ALTERNATE ALUM ALUMINUM ARCH ARCHITECT ART ARTWORK AWP ACOUSTICAL WALL PANEL AWT ACOUSTICAL WALL TREATMENT	BLKG BLOCKING BO_ BOTTOM OF: DECK, BEAM, STEEL BRG BEARING BRK BRICK CB CHALK BOARD CC COLUMN COVER CCF COLUMN COVER FINISH CCT CUBICLE CURTAIN CF CUSTOM FABRICATION CFOI CONTRACTOR FURNISHED / OWNER INSTALLED CFF CONCRETE FLOOR FINISH CG CORNER GUARD CSA CUNNINGHAM GROUP ARCHITECTURE, INC. CJ CONTROL JOINT CK CORK CL CENTER LINE CLR CLEARANCE CMP COMPOSITE METAL PANEL CMU CONCRETE MASONRY UNIT CONC CONCRETE CONT CONTINUOUS / CONTINUE CP CEMENT PLASTER CPT CARPET TILE OR BROADLOOM CPTB CARPET BASE CT CERAMIC / PORCELAIN TILE CTB CERAMIC TILE BASE DEC DECORATIVE CONCRETE DF DRINKING FOUNTAIN DIA DIAMETER DIV DIVISION DN DOWN DRP DRAPERY/CURTAINS DWGS DRAWINGS DWP DECORATIVE WALL PANEL	(E) / EXIST EXISTING E-FIXT ELECTRICAL FIXTURE EJ EXPANSION JOINT EL ELEVATION ELEC ELECTRICAL ELEV ELEVATOR EQ EQUAL EWC ELECTRICAL WATER COOLER EXP EXPOSED EXT EXTERIOR FAB FABRIC, NON-UPHOLSTERY FAF FLUID APPLIED FLOORING FD FLOOR DRAIN FE / FEC FIRE EXTINGUISHER (CABINET) FF / FFE FINISH FLOOR (ELEVATION) FF&E FIXTURES, FURNISHINGS & EQUIPMENT FIN FINISH FLR FLOORING FCEW FACE OF EXISTING WALL FOS FACE OF STUD FRP FIBERGLASS REINFORCED WALL PANEL FRT FIRE TREATED GA GAUGE GALV GALVANIZED GB GYPSUM BOARD GC GENERAL CONTRACTOR GFRG GLASS FIBER REINFORCED CONCRETE GFRG GLASS FIBER REINFORCED GYPSUM GFRP GLASS REINFORCED PLASTIC GL GLASS, GLAZING GMU GLAZED MASONRY UNIT GT GLASS TILE GYP GYPSUM	HB HOSE BIBB HDBD HARDBOARD HDWD HARD WOOD HDMR HARDWARE HM HOLLOW METAL HSS HOLLOW STEEL SECTION HYD HYDRANT ID INSIDE DIAMETER INSUL INSULATION INT INTERIOR L-FIXT LIGHT FIXTURE LAV LAVATORY LLH LONG LEG HORIZONTAL LLV LONG LEG VERTICLE LMC LINEAR METAL CEILING LWC LINEAR WOOD CEILING MAS MASONRY MAT CARPET/WALK-OFF MAT MATL MATERIAL MAX MAXIMUM MB MARKER BOARD MDF MEDIUM DENSITY FIBERBOARD MECH MECHANICAL MG METAL GRATE MIN MINIMUM MIR MIRROR(ED) MO MASONRY OPENING MTD MOUNTED MTL METAL MTLT METAL TRIM NA NOT APPLICABLE NIC NOT IN CONTRACT NOM NOMINAL NTS NOT TO SCALE OC ON CENTER(S) OD OUTSIDE DIAMETER OF/OI OWNER FURNISHED / CONTRACTOR INSTALLED OF/OI OWNER FURNISHED / OWNER INSTALLED OFRO OVERFLOW ROOF DRAIN OFS OVERFLOW SCUPPER OH OVERHEAD OPNG OPENING OZ OUNCE P-FIXT PLUMBING FIXTURE PARTBD PARTICLEBOARD PC PRECAST PL PLATE PLAM PLASTIC LAMINATE PLS PLASTER PLY PLYWOOD PME PATCH TO MATCH EXISTING PNL PANEL PREFIN PREFINISHED PRV PRESERVATIVE PRV POWER ROOF VENTILATOR PT PAINT(ED) PT EXT EXTERIOR PAINT PV PLUMBING VENT QT QUARRY TILE QTB QUARRY TILE BASE QTY QUANTITY R RISER RAD RADIUS RB RESILIENT BASE RO ROOF DRAIN REF REFERENCE / REFER TO REQD REQUIRED RF RESILIENT FLOORING RMAT RECESSED MAT RO ROUGH OPENING RTU ROOF TOP UNIT S SEAL SC SEALED CONCRETE SCF SPECIAL CONCRETE FINISH SE SEATING SF SQUARE FOOT/FEET SFCS STRETCHED FABRIC CEILING SYSTEM SFWS STRETCHED FABRIC WALL SYSTEM SGFT STRUCTURAL GLAZED FACING TILE SHG SHEATHING SIM SIMILAR SMCS STRETCHED MEMBRANE CEILING SYSTEM SP SPECIALTY FINISH	SPF SPRAY POLYURETHANE FOAM SPT SPECIAL PAINT SS STAINLESS STEEL SSF SOLID SURFACE ST STAIN STN STONE STNB STONE BASE STNF STONE FLOORING STNT STONE TILE STNV STONE VENEER SUSP SUSPENDED SV SHEET VINYL SWF SPECIALTY WALL FINISH SYST SYSTEM T TREAD T&G TONGUE AND GROOVE TB TACKBOARD TBL TABLE TERB TERRAZZO BASE TERR TERRAZZO TERT TERRAZZO TILE TFC TEXTURED FINISH CEILING TO_ TOP OF: DECK, CONCRETE, BEAM, PARAPET, STEEL WALL TP TOILET PARTITION TS TRANSITION STRIP TYP TYPICAL UNFIN UNFINISHED UNO UNLESS NOTED OTHERWISE UPH UPHOLSTERY VIF VERIFY IN FIELD VNR VENEER VP VENEER PLASTER VR VAPOR RETARDER VSE VENEER SHELF ELEVATION WB WEATHER BARRIER WC WATER CLOSET WCV WALL COVERING WD WOOD WDB BLK WOOD BLOCKING WDB WOOD BASE WDF WOOD FLOORING WDT WOOD TRIM WDV WOOD VENEER WDW WINDOW WP WORK POINT WPT WALL PROTECTION WT WINDOW TREATMENT XPS EXTRUDED POLYSTYRENE # NUMBER / POUND & AND @ AT
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General Notes

- Not all areas of the building have work under this contract.
- Refer to code plans for all code related information including rated wall locations and types, fire walls, exiting, building areas and construction type requirements, fireproofing requirements, etc. Should discrepancies be found between the code plans and contract documents, notify the architect before proceeding with the work.
- Contractor is responsible for the protection of existing finishes to remain where exposed to construction activities. Finishes damaged in the construction activities are to be replaced by the contractor with new to match existing at no expense to the owner. Contact architect with questions.
- Drawings shall not be scaled for exact dimensions.
- Portions of the information shown on these drawings were derived from existing drawings and on-site observation. Drawings are not to be construed as "as-built" conditions and the contractor shall field verify dimensions and actual installed conditions. In the event of a discrepancy between on-site conditions and the contract documents, the contractor shall notify architect of such discrepancies before proceeding with the work.
- Unless noted otherwise dimensions are nominal and are to finished face of stud walls, face of masonry or concrete, and centerline of columns.
- Any disruption of existing utilities shall be coordinated and scheduled with the owner minimum one week prior to starting work.
- All existing building elements and conditions not indicated to be removed are to be protected for the duration of construction. Any damage to existing conditions that are to remain shall be restored or replaced at replacement value to match existing conditions under the prime contract without additional cost to the owner.
- Existing conditions on the drawings are shown shaded.
- All key notes on each sheet may not necessarily refer to items on that sheet.
- The scope of patching includes all existing surfaces exposed to view that are disturbed by work under the general contract. Unless noted otherwise patching is to match the adjacent existing surfaces in material, texture, and finish.
- Subcontractors shall visit the job site and shall review the contract documents to familiarize themselves with the requirements and intent of the scope of the work prior to commencement of work. Discrepancies shall be reported to the general contractor for clarification.
- All dissimilar metallic materials shall be effectively isolated from each other to prevent galvanic action and resultant corrosion.
- In addition to any fire extinguishers shown in these drawings, provide fire extinguishers at all locations required by the fire code official. The specific type of fire extinguisher required at each location shall be directed by the fire code official. Fire extinguisher mounting (surface, recessed, cabinet, etc.) shall be subject to the review and approval of the architect.
- Provide "Maximum Occupancy" signs in compliance with all applicable codes and regulations. The design and location of these signs are subject to the review and approval of the architect.

Property Description

REFER TO CIVIL DRAWINGS OR SURVEY FOR MORE INFORMATION

LEGAL DESCRIPTION:

LOT 2, BLOCK 1, PICKENS TECHNOLOGY CENTER SUBDIVISION NO. 2, LOCATED IN THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M., CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.

Project Description

GOVERNING CODE:	2021 IBC WITH COLORADO AMENDMENTS
BUILDING TYPE:	TYPE IIB NEW CONSTRUCTION
PRIMARY OCCUPANCY TYPE:	GROUP S-2
NEW CONSTRUCTION (SF):	187,200 SF
REMODELING (SF):	0 SF
CONSTRUCTION MATERIALS:	PRE-ENGINEERED METAL BUILDING SYSTEM
PROGRAM DESCRIPTION:	DISTRICT SCHOOL BUS PARKING LOT

Materials

ALUMINUM	INSULATION - BATT
BRICK	INSULATION - RIGID
CERAMIC TILE / RESILIENT TILE	PARTICLE BOARD
CONCRETE - CAST-IN-PLACE	PLASTER / GROUT
CONCRETE - PRECAST	PLYWOOD
CONCRETE BLOCK	ROUGH LUMBER / WOOD FRAMING
EARTH	WOOD BLOCKING
EXISTING CONDITIONS	SAND / GRANULAR FILL
WOOD - FINISHED	STONE
GLASS	STEEL / STEEL STUD FRAMING
GRAVEL/STONE FILL	TERRAZZO
GYPSUM WALL BOARD	

PRELIMINARY
NOT FOR CONSTRUCTION

Revisions

No.	Date	Description
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Project Information

Phase:	Site Plan Submittal	Date:	July 29, 2021
Project No.:	20-0597	PIC / AIC:	Kari-eln Mock

Aurora Public Schools Bus Canopy

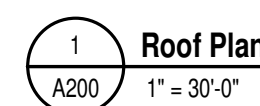
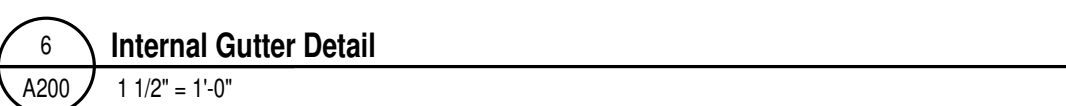
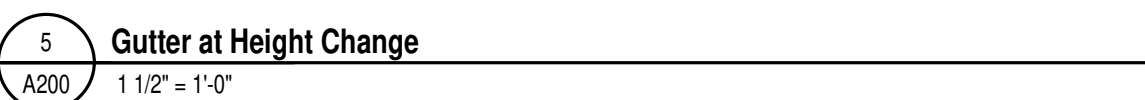
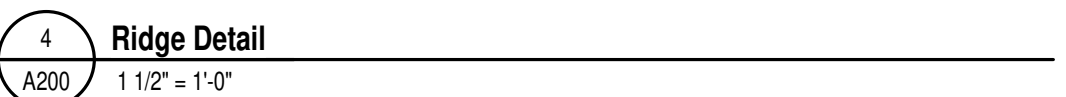
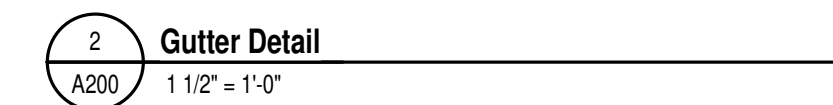
Sheet Title

General Information

Sheet Number

G001

Current Revision



(E) BUS
MAINT.
BUILDING -
NIC

E 1ST AVE

E CENTRETECH PKWY

- PRE-FABRICATED ROOFING SYSTEM
- GUTTER SYSTEM CONNECTED TO DOWNSPOUTS @ 30' INTERVALS
- PHOTOVOLTAIC PANEL SYSTEM

SKYLIGHT, TYP.

Cunningham

1500 Wynkoop Street | Suite 300 | Denver | CO 80202
cunningham.com

**PRELIMINARY
NOT FOR CONSTRUCTION**

Revisions		
No.	Date	Description

Project Information			
Phase:	Site Plan Submittal	Date:	July 29, 2021
Project No.:	20-0597	PIC / AIC:	Kari-eln Moe

Aurora Public Schools Bus Canopy

Sheet Title

Roof Plan and Roof Details

Sheet Number Current Revision

A200

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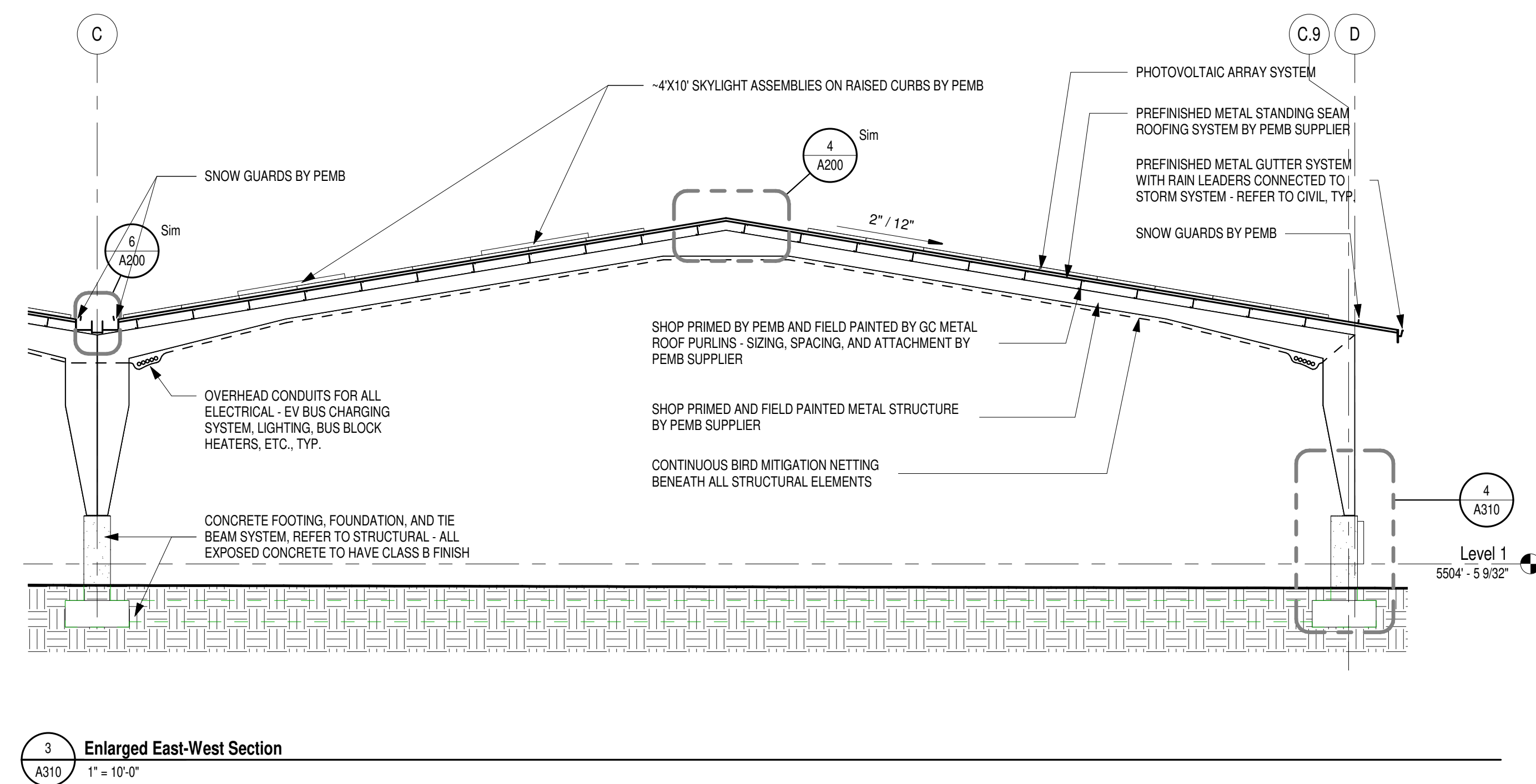


Revisions		
No.	Date	Description

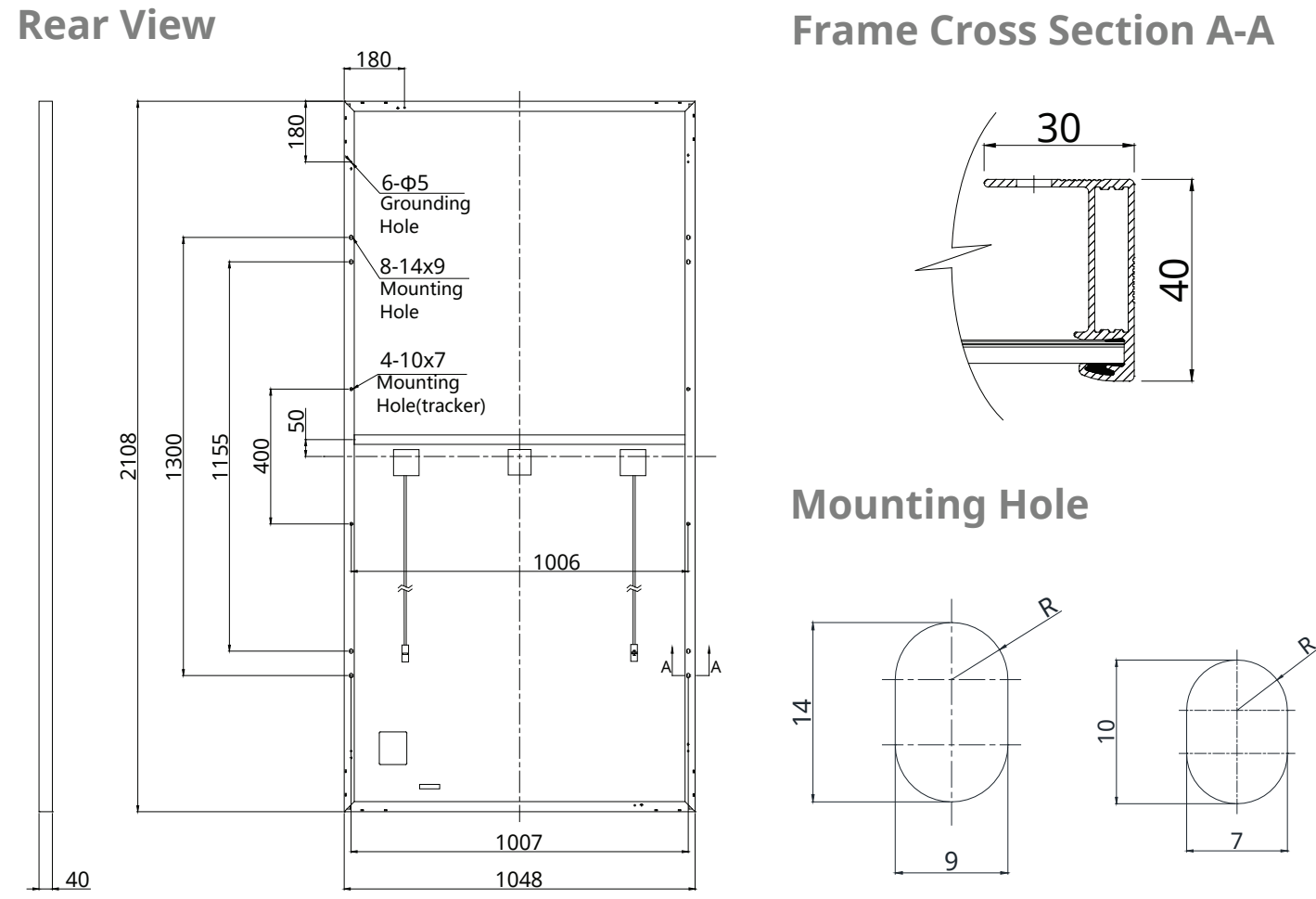
Aurora Public Schools Bus Canopy

Sheet Number _____ **Current Revision** _____

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ENGINEERING DRAWING (mm)



ELECTRICAL DATA | STC*

CS3W	430MS	435MS	440MS	445MS	450MS	455MS
Nominal Max. Power (Pmax)	430 W	435 W	440 W	445 W	450 W	455 W
Opt. Operating Voltage (Vmp)	40.3 V	40.5 V	40.7 V	40.9 V	41.1 V	41.3 V
Opt. Operating Current (Imp)	10.68 A	10.75 A	10.82 A	10.89 A	10.96 A	11.02 A
Open Circuit Voltage (Voc)	48.3 V	48.5 V	48.7 V	48.9 V	49.1 V	49.3 V
Short Circuit Current (Isc)	11.37 A	11.42 A	11.48 A	11.54 A	11.60 A	11.66 A
Module Efficiency	19.5%	19.7%	19.9%	20.1%	20.4%	20.6%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)					
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	20 A					
Application Classification	Class A					
Power Tolerance	0 ~ + 10 W					

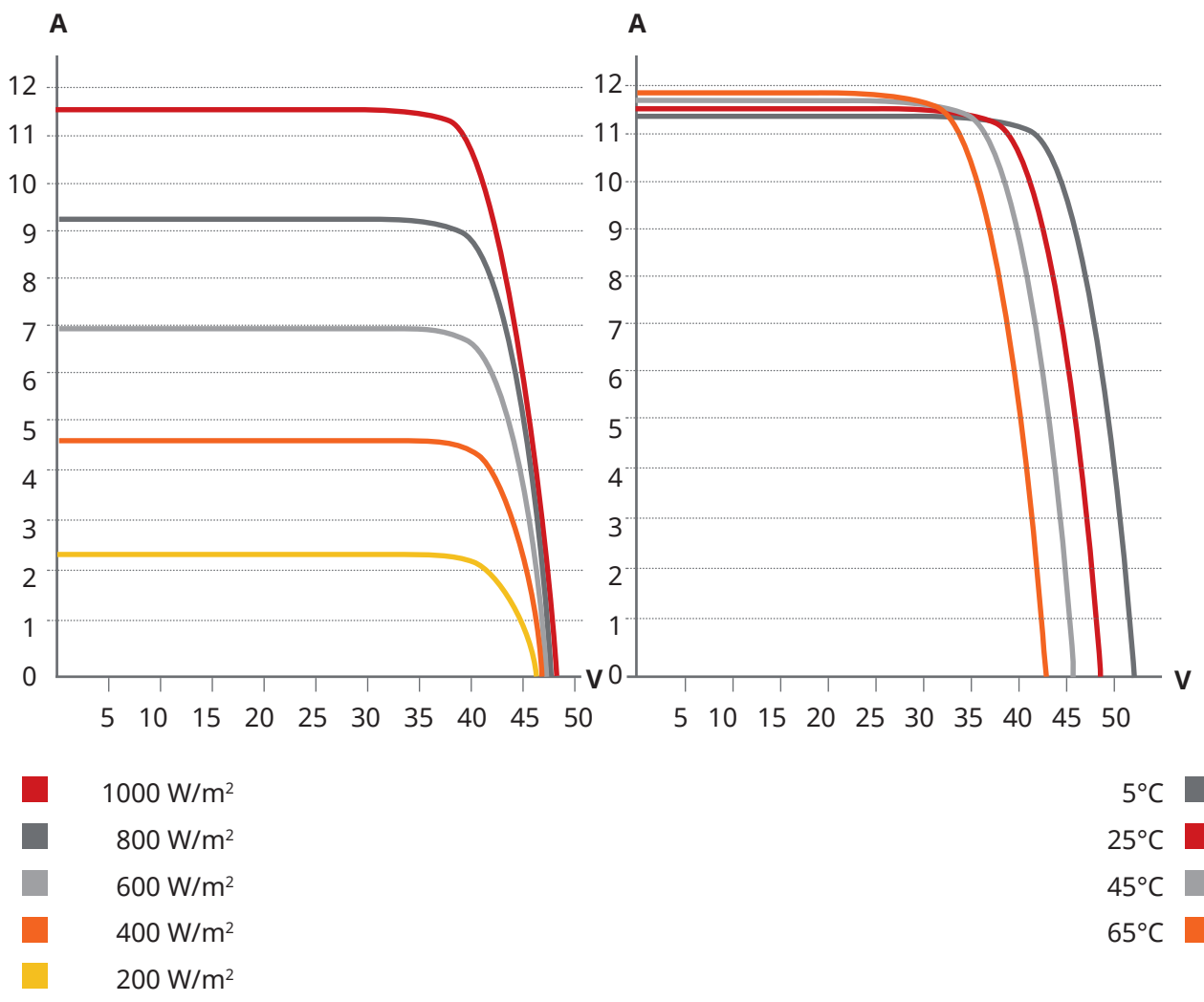
* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS3W	430MS	435MS	440MS	445MS	450MS	455MS
Nominal Max. Power (Pmax)	321 W	325 W	328 W	332 W	336 W	339 W
Opt. Operating Voltage (Vmp)	37.6 V	37.8 V	37.9 V	38.1 V	38.3 V	38.5 V
Opt. Operating Current (Imp)	8.54 A	8.59 A	8.65 A	8.71 A	8.76 A	8.82 A
Open Circuit Voltage (Voc)	45.4 V	45.6 V	45.8 V	46.0 V	46.2 V	46.4 V
Short Circuit Current (Isc)	9.17 A	9.21 A	9.26 A	9.31 A	9.36 A	9.41 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

CS3W-435MS / I-V CURVES



MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	144 [2 X (12 X 6)]
Dimensions	2108 X 1048 X 40 mm (83.0 X 41.3 X 1.57 in)
Weight	24.9 kg (54.9 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy, crossbar enhanced
J-Box	IP68, 3 bypass diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 500 mm (19.7 in) (+) / 350 mm (13.8 in) (-); landscape: 1400 mm (55.1 in); leap-frog connection: 1670 mm (65.7 in)*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	27 pieces
Per Container (40' HQ)	594 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.35 % / °C
Temperature Coefficient (Voc)	-0.27 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION



* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

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Current Proposed Solar Panel Specs:

Canadian Solar CS3W-430MS

SPECIFICATIONS		PVI 60KW	PVI 82KW	PVI 95KW
DC Input				
Absolute Maximum Input Voltage		600 VDC		
MPPT Input Voltage Range		312-500 VDC		
MPPT Input Voltage Range - Low Voltage Option		296-500 VDC		
Maximum Operating Input Current		201 A	278 A	320 A
Maximum Operating Input Current - Low Voltage Option		212 A	293 A	337 A
AC Output				
Nominal Output Voltage		208, 240, 480 or 600 VAC, 3-Ph (4 wire option)		
AC Voltage Range (Standard)		-12%/+10%		
Continuous Output Power		60 kW	82 kW	95 kW
Continuous Output Current	208 VAC	167 A	228 A	264 A
	240 VAC	145 A	198 A	229 A
	480 VAC	73 A	100 A	115 A
	600 VAC	58 A	80 A	92 A
Maximum Backfeed Current		0 A		
Nominal Output Frequency		60 Hz		
Output Frequency Range		59.3-60.5 Hz		
Power Factor		Unity, >0.99		
Total Harmonic Distortion (THD)		<3%		
Efficiency				
Peak Efficiency	208/240 VAC	95.7%	95.6%	95.3%
	480/600 VAC	96.5%	96.5%	96.5%
CEC Efficiency	208 VAC	94.0%	94.5%	94.5%
	480 VAC	95.5%	95.5%	95.5%
Tare Loss	208 VAC	4 W		
	240 VAC	4 W		
	480 VAC	5 W		
	600 VAC	7 W		
Subcombiner Options				
		2-8 positions, 40-275 A		
Temperature				
Ambient Temperature Range (full power)		-13°F to +122°F (-25°C to +50°C)		
Storage Temperature Range		-13°F to +122°F (-25°C to +50°C)		
Relative Humidity (non-condensing)		5-95%		
Monitoring Options				
Web-based Monitoring (Inverter Direct)		SolrenView		
Revenue Grade Monitoring		External		
Sub-Array Monitoring (SolZone)		2-8 zones		
Cellular Communication		SolrenView AIR		
Third Party Compatibility		Standard via MODBUS		
Testing & Certifications				
Safety Listings & Certifications		UL 1741/IEEE 1547, IEEE 1547.1, IEEE 62.41.2, IEEE 62.45, IEEE C37.90.2, CSA C22.2#107.1, FCC part 15 B		
Testing Agency		ETL		
Warranty				
Standard		5 year		
Optional		10, 15, 20 year; extended service agreement; uptime guarantee		
Enclosure				
Transformer		Standard, fully-integrated (internal)		
AC/DC Disconnects		Standard, fully-integrated		
Dimensions 208/240 VAC (H x W x D)		76 in. x 56 in. x 29.3 in. (1930 mm x 1422 mm x 744 mm)		
Dimensions 480/600 VAC (H x W x D)		76 in. x 54 in. x 25.3 in. (1930 mm x 1372 mm x 643 mm)		
Weight		1526 lbs (694 kg)	1615 lbs (734 kg)	1748 lbs (794 kg)
Enclosure Rating		NEMA 3R		
Enclosure Finish		Polyester powder coated steel; Optional stainless steel		

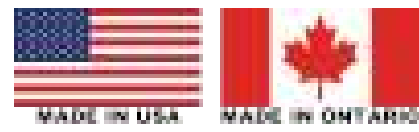
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Revisions		
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Sheet Title
**SOLAR PV
SPECIFICATIONS**

Sheet Number, Current Revision

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