

Andrew Tisue

From: Andrew Tisue
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 Tisue AIA, WELL AP, LEED Green Associate
Associate

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

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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 Tisue <atisue@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 ANGRCA/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 ANGRCA/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

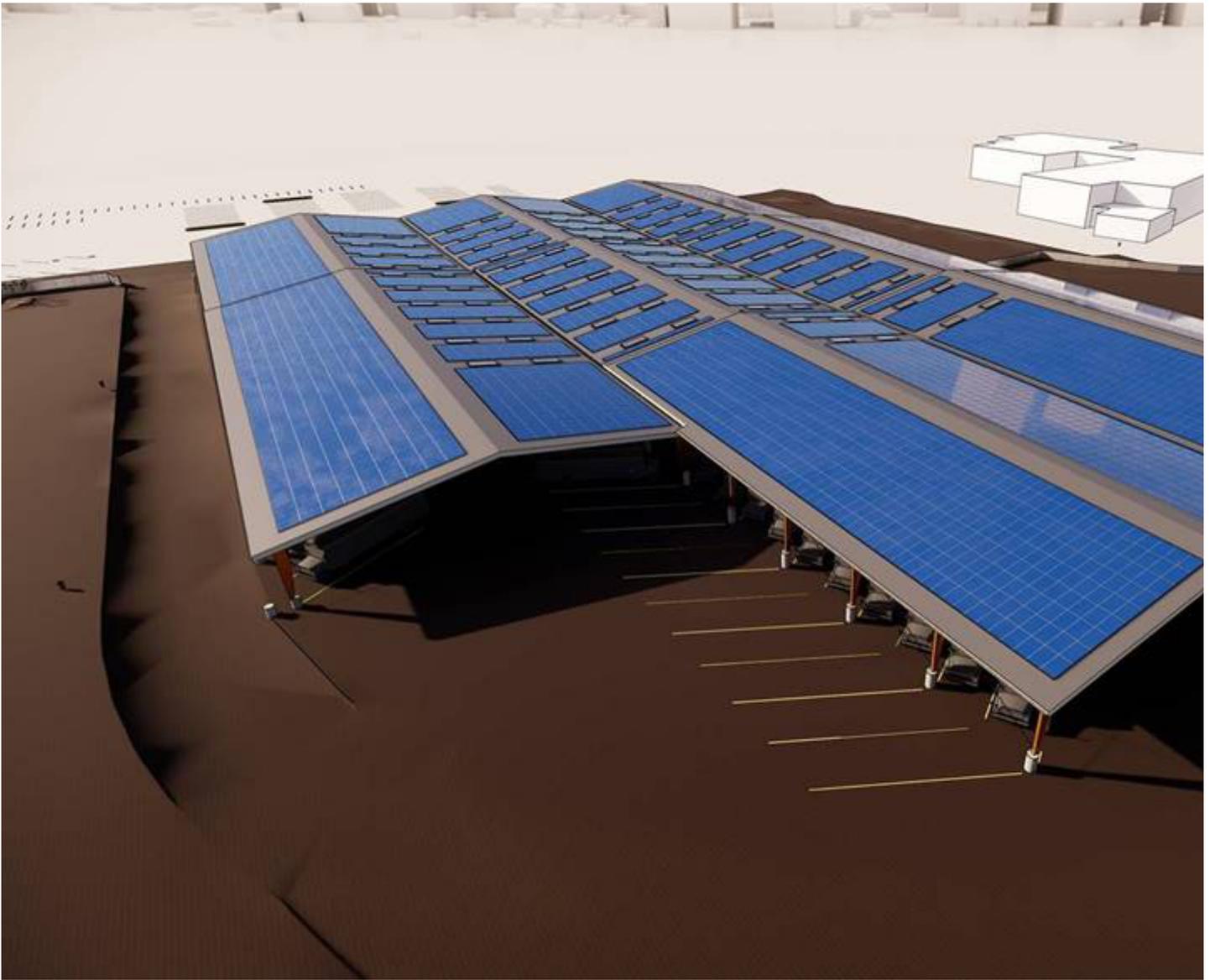
Hi Porter,

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 Tisue AIA, WELL AP, LEED Green Associate
Associate

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

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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 Tisue <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

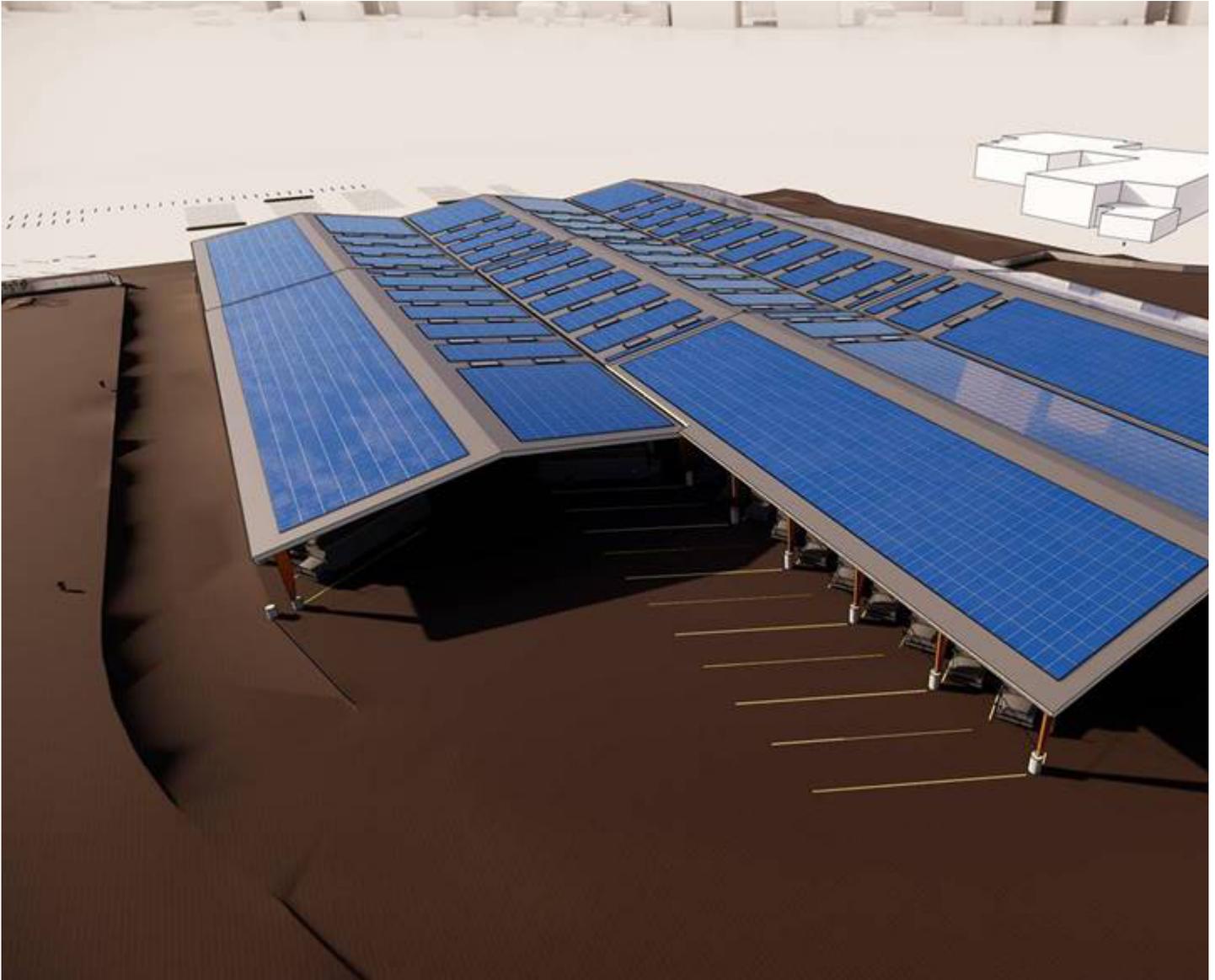


Nature of the Project

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

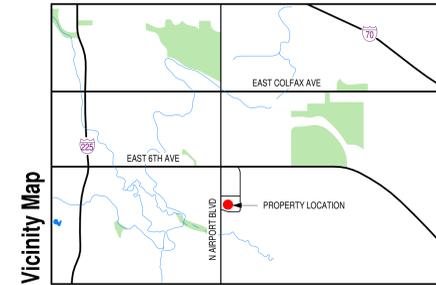
Update on our office reopening



Project Image

AURORA PUBLIC SCHOOLS BUS CANOPY

160 NORTH AIRPORT BOULEVARD AURORA, COLORADO 80011



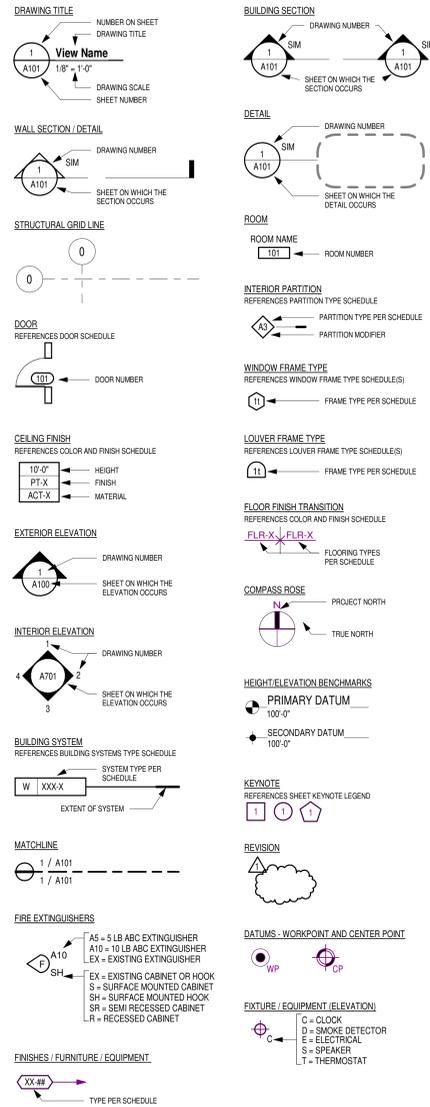
Vicinity Map

Cunningham

Contacts

Owner	Architect	Civil Engineer
Name: Aurora Public Schools	Name: Cunningham	Name: JVA, Inc.
Contact: Fredrick Boening	Contact: Andrew Tissue	Contact: Ty Parker
Address:	Address: 201 SE Main Street Suite 325 Minneapolis, MN 55414	Address: 1512 Larmer Street Suite 717 Denver, CO 80202
Phone: (720) 584-8057	Phone: (612) 379-5536	Phone: (303) 565-4907
E-Mail: fboening@auroras12.org	E-Mail: atissue@cunningham.com	E-Mail: tparker@jvavca.com
Structural Engineer	Electrical Engineer	
Name: K&A Engineers and Builders	Name: WSP	
Contact: Heath C. Stein	Contact: Raak 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@kaeb.com	E-Mail: raak.lanning@wsp.com	

Graphic Symbols



Abbreviations

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

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 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.

Sheet Index

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 6, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH E.M., CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.

Project Description

GOVERNING CODE:	2021 IBC WITH COLORADO AMENDMENTS
BUILDING TYPE:	TYPE 1B 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

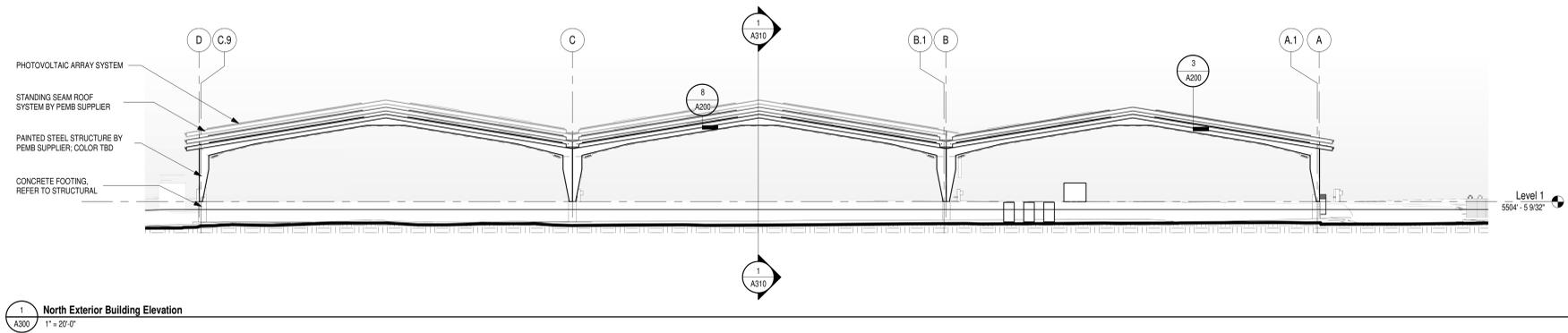
Project Information			
Phase:	Site Plan Submittal	Date:	July 29, 2021
Project No.:	20-0597	PIC / AIC:	Kari-elin Mock

Aurora Public Schools Bus Canopy

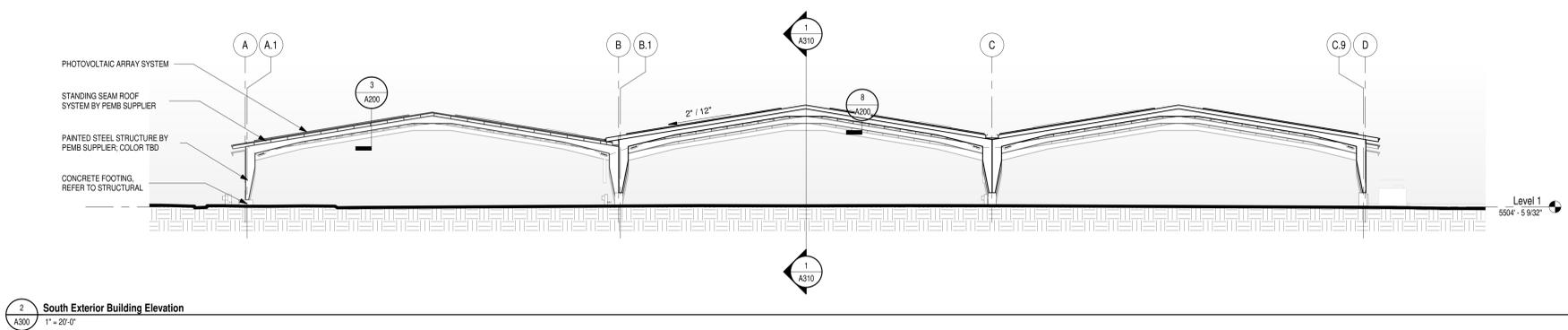
Sheet Title
General Information

Sheet Number: **G001** Current Revision

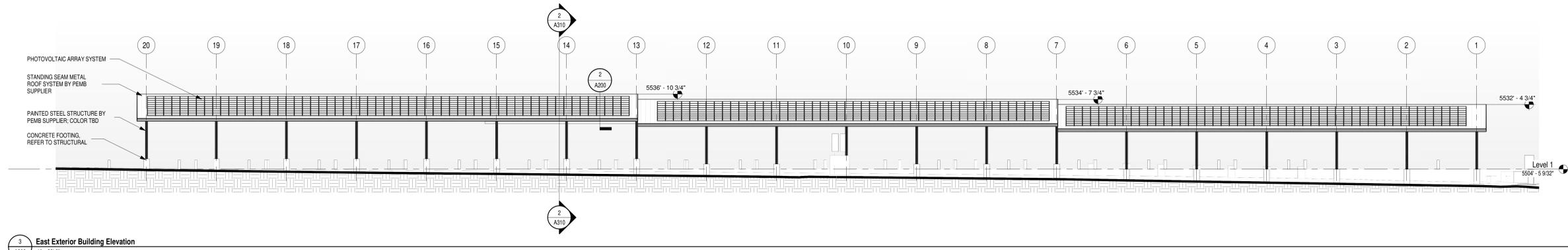
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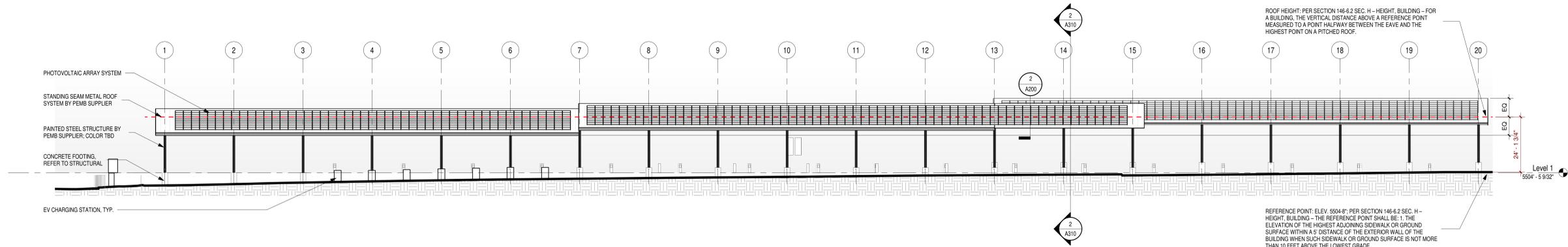
1 North Exterior Building Elevation
1" = 20'-0"



2 South Exterior Building Elevation
1" = 20'-0"



3 East Exterior Building Elevation
1" = 20'-0"



4 West Exterior Building Elevation
1" = 20'-0"

**PRELIMINARY
NOT FOR CONSTRUCTION**

Revisions		
No.	Date	Description

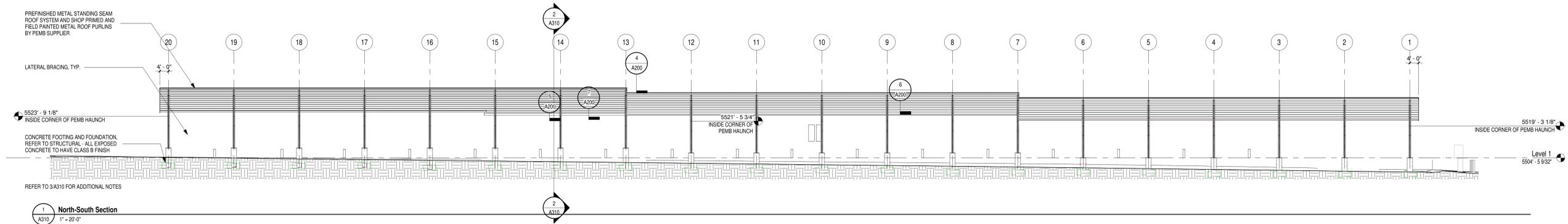
Project Information
Phase: Site Plan Submittal | Date: July 29, 2021
Project No.: 20-0597 | PIC / A/C: Karim Mook
Aurora Public Schools Bus Canopy

Sheet Title
Exterior Elevations

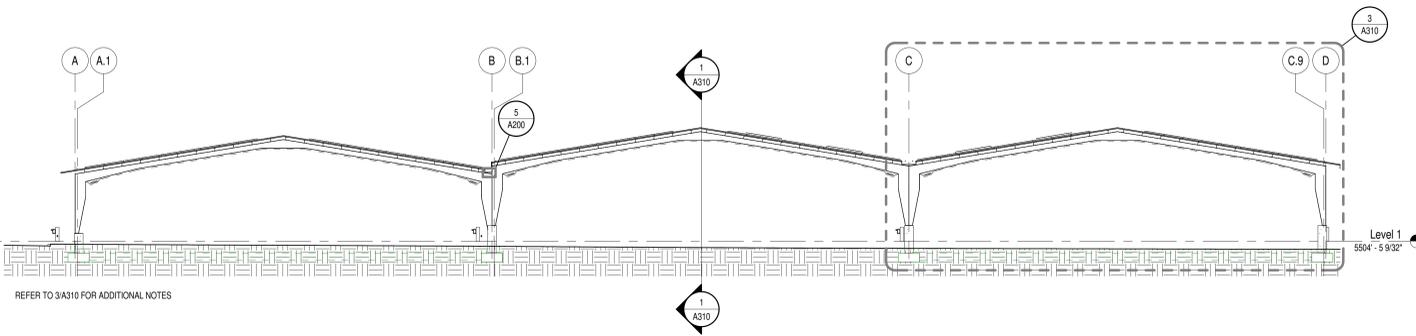
Sheet Number | **Current Revision**
A300

ROOF HEIGHT: PER SECTION 146-6.2 SEC. H - HEIGHT, BUILDING - FOR A BUILDING, THE VERTICAL DISTANCE ABOVE A REFERENCE POINT MEASURED TO A POINT HALFWAY BETWEEN THE EAVE AND THE HIGHEST POINT ON A PITCHED ROOF.

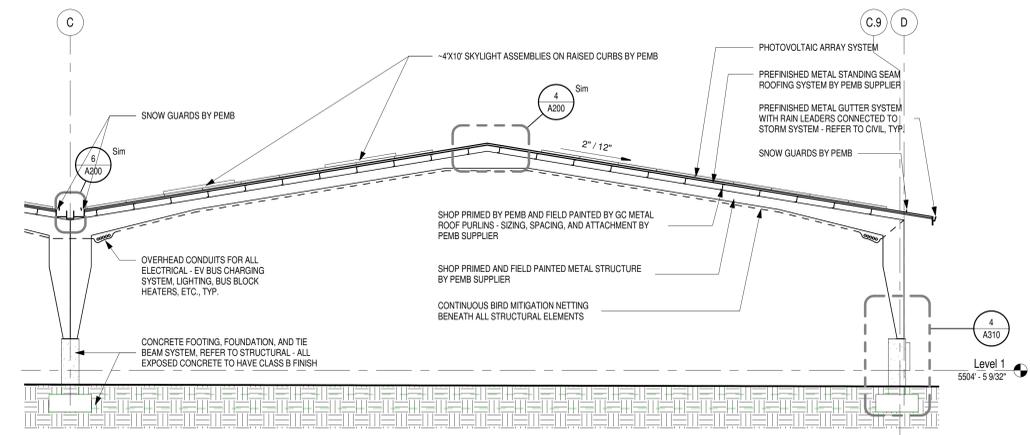
REFERENCE POINT: ELEV 5504'-8" PER SECTION 146-4.2 SEC. H - HEIGHT, BUILDING - THE REFERENCE POINT SHALL BE: 1. THE ELEVATION OF THE HIGHEST ADJOINING SIDEWALK OR GROUND SURFACE WITHIN A 5' DISTANCE OF THE EXTERIOR WALL OF THE BUILDING WHEN SUCH SIDEWALK OR GROUND SURFACE IS NOT MORE THAN 10 FEET ABOVE THE LOWEST GRADE.



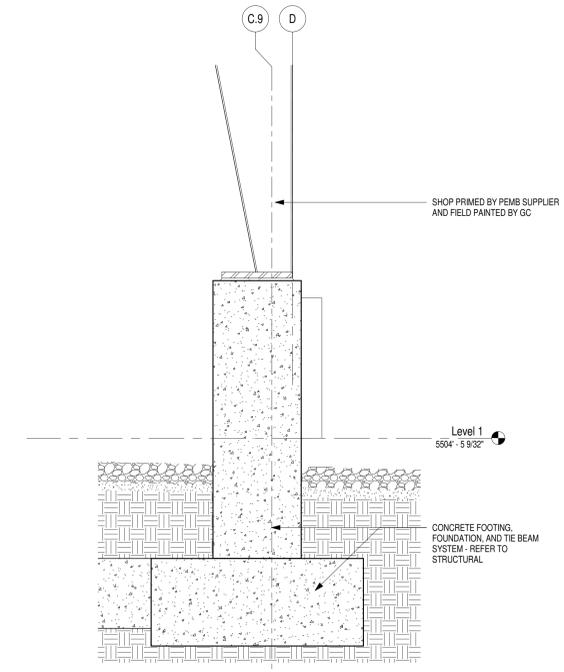
1 North-South Section
A310 1" = 20'-0"



2 East-West Section
A310 1" = 20'-0"



3 Enlarged East-West Section
A310 1" = 10'-0"



4 Pier Detail
A310 1/2" = 1'-0"

**PRELIMINARY
NOT FOR CONSTRUCTION**

Revisions		
No.	Date	Description

Project Information			
Phase:	Site Plan Submittal	Date:	July 29, 2021
Project No.:	20-0597	PIC / A/C:	Kari-elin Mock

Aurora Public Schools Bus Canopy

Sheet Title
Building Sections and Wall Sections

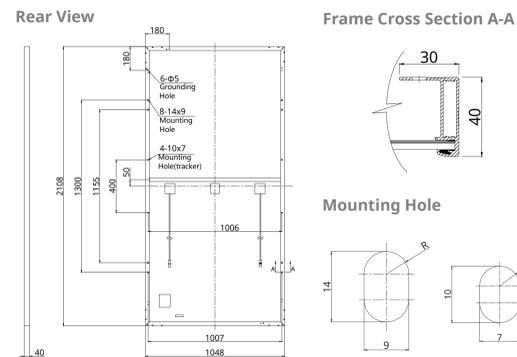
Sheet Number _____ Current Revision _____

A310

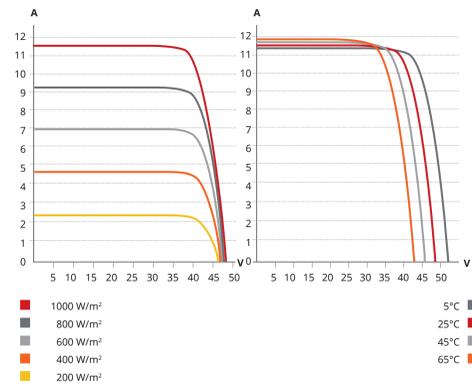
Current Proposed Solar Panel Specs:

Canadian Solar CS3W-430MS

ENGINEERING DRAWING (mm)



CS3W-435MS / I-V CURVES



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.

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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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
	240 VAC	145 A	198 A
	480 VAC	73 A	100 A
	600 VAC	58 A	80 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%
	480/600 VAC	96.5%	96.5%
CEC Efficiency	208 VAC	94.0%	94.5%
	480 VAC	95.5%	95.5%
Tare Loss	208 VAC	4 W	4 W
	240 VAC	4 W	4 W
	480 VAC	5 W	5 W
	600 VAC	7 W	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		
No.	Date	Description

Project Information		
Phase:	Date:	Issue Date:
Project No.: 31300095.00	PIC/AIC:	



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Sheet Title
SOLAR PV SPECIFICATIONS

Sheet Number _____ Current Revision _____

E904

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