

PROJECT PROGRESS REPORT

Midland Court House

605 Yonge St, Midland, ON L4R 2E1, Canada

RAINSCREEN INSTALLATION SYSTEM

 **MITREX**[™]
BUILDING-INTEGRATED SOLAR TECHNOLOGY

INTRODUCTION

Mitrex improved the aesthetics of the 605 Yonge St building while transforming the structure into a green, energy-generating power plant. The improved area on the building utilizes Mitrex Solar Facades with a wood pattern spanning over 10,000 SQFT and generating energy with a system size of over 160kW.

The structure features an improved building envelope while seamlessly generating solar energy.

ABOUT MITREX

At Mitrex, we envision a world where solar energy is generated by any surface touched by the sun. We have developed ways for aesthetically pleasing solar panels to be directly integrated into building facades. Our revolutionary building-integrated photovoltaic (BIPV) systems offer architects, engineers, building owners, and investors the opportunity to embrace and profit from solar energy without compromising beauty. Our Mission is to be the catalyst that accelerates the adoption of sustainable, energy-generating, human-made structures.

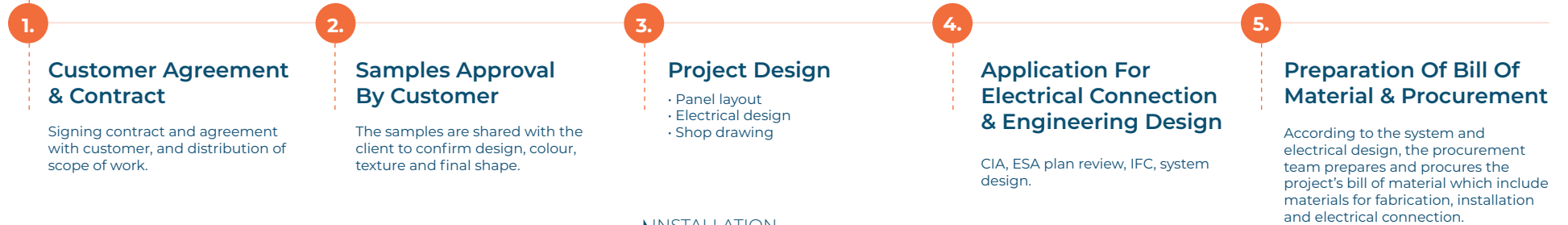


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PROJECT JOURNEY SUMMARY

PREPARATION & LOGISTICS



INSTALLATION



FINAL OUTPUT



CONCEPTUAL RENDER



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
1	PROJECT MANAGEMENT		
1.1	Project planning, construction management on site and construction meeting and reporting construction meeting and reporting.	X	X
1.2	Progress reporting.	X	
1.3	General Coordination of the project with Client.	X	
1.4	Health and safety management.	X	X
1.5	Coordination between Employer, subcontractors, and authorities (including hydro company).	X	X
1.6	Construction site insurance.	X	X
1.7	Construction signage (transportation, warnings).	X	X
2	DOCUMENTATIONS		
2.1	Safety Induction Documentation.	X	
2.2	Method Statement & Risk Assessment for Installation.	X*	
2.3	HSE Compliance Documentation.	X*	
2.4	Hydro Commissioning Documentation.	X	
2.5	Markup of IFC drawings for any changes to be incorporated into the as-built drawings.	X	
3	PERMITS		
3.1	Relation and permitting with municipality regarding building permits.		X
3.2	Relation and permitting with ESA.	X	
3.3	Relation and permitting with hydro company.	X	



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
3.4	Hydro Permitting: Engineering, drawings, and documentation.	X	
3.5	Hydro Permitting: Information gathering and coordination.	X	X
3.6	All local and federal government building permit charges.		X
3.7	Negotiations with hydro to turn off the high-tension lines and obtain any necessary permits. Assumption of responsibility for the delays occurred because of this omission to do so and payment of any fees relating to that.	X	X
4	DESIGN		
4.1	DC Works Engineering		
4.1.1	General and detailed wiring layout design.	X	
4.1.2	Detailed execution drawings design (including earthing layout).	X	
4.1.3	Communication design (protocols and wires).	X	
4.1.4	Definition of metering devices dedicated to control system and located at Point of Interconnection.	X	
4.1.5	Panel and string connection scheme.	X	
4.1.6	Inverters & Transformers definition.	X	
4.1.7	AC/DC cables definition wiring with calculation note.	X	
4.2	AC Works Engineering		
4.2.1	Basic Design.	X	
4.2.2	Detailed execution drawings design.	X	
4.2.3	Equipment and protection definition (included AC Junction Box).	X	



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
4.3	Other Engineering		
4.3.1	Shop drawings, engineering - All engineering for panel systems, including calculations stamped by a professional engineer in Toronto.	X	
4.3.2	Trenches design (if applicable)	X	
4.3.3	Full shading analysis	X	
4.3.4	Update of the Structural study provided by the client that the additional load capacity will not affect the structure.	X	
4.3.5	Temporary facilities layout (if needed).	X	
5	PROCUREMENT		
5.1	Photovoltaics Modules		
5.1.1	Photovoltaic railings.	X	
5.1.2	Fenced allocated storage area on site for PV modules.	X	
5.2	Electrical Equipment		
5.2.1	LVDB, rapid shutdown, panel board, and disconnect.	X	
5.2.2	String inverters, transformer (if needed).	X	
5.2.3	Monitoring system.	X	
5.3	Structure & Mechanical		
5.3.1	Anchorage, mounting accessories, and fasteners.	X	
5.3.2	HSE permanent protections.		X
5.3.3	Window sill flashing.		X



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
5.3.4	Thru-wall or counter flashings.		X
5.4	Bulk (Cabling and Miscellaneous)		
5.4.1	Cable trays and conduits.	X	
5.4.2	DC cables (String to PV inverter).	X	
5.4.3	AC cables (Inverter to Point of Interconnection).	X	
5.4.4	Communication cables.	X	
5.4.5	Earthing cables.	X	
5.4.6	Protections (Fuses, MCB).	X	
5.5	Grid connection		
5.5.1	LV panel extension works.		X
6	CONSTRUCTION		
6.1	System Installation		
6.1.1	Installation of cable trays/conduits.	X	
6.1.2	Installation of photovoltaic railings including mechanical anchoring and mounting.	X	
6.1.3	Cutting and patching of slab edges.		X
6.1.4	Installation of wood backing or blocking.		X
6.1.5	Installation of any exterior lighting, cameras, conduits, and all other electrical components.		X
6.1.6	Any / all structural anchors and fasteners.	X	



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
6.1.7	Substrate framing, structural supports, structural steel and metal stud framing, structural steel studs, sheathing products (DensGlass, plywood, etc.), top parapet, top parapet flashing. System depth passing 8" will be considered as a structural component.		X
6.1.8	Leveling the structure and existing walls		X
6.1.9	Supply or installation of windows or doors		X
6.1.10	Removal of any overhead obstacles (trees, electrical wiring, cables etc.), exterior lighting, cameras and others which could interfere with the installation of the system.		X
6.1.11	Provisions and maintenance of work areas, storage areas with worksite access and security, and sufficient loading capacity at any time to allow for vehicle and equipment circulation for storage of materials, and removal of snow preventing the access during winter season.		X
6.1.12	Supply or installation of miscellaneous metals such as support shelves, access ladders, railings, bollards and/or fencing, exterior or interior stairs.	X	
6.1.13	Provision of security of panels and other materials at the job site.		X
6.2	Electrical Installation		
6.2.1	Electrical material installation (including inverter, monitoring system, etc).	X	
6.2.2	Stringing & PV panel interconnection.	X	
6.2.3	DC and AC wiring.	X	
6.2.4	Earthing & all protections system wiring.	X	
6.2.5	Meter and interface protection installation.	X	
6.3	Other Works		
6.3.1	PPE and safety harness.	X	
6.3.2	Tools & consumables.	X	



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
6.3.3	Scaffolding.	X	
6.3.4	Material unloading and shifting to offloading area.	X	
6.3.5	Material distribution from offloading area.	X	
6.3.6	Temporary site facilities (Toilet, etc).	X	
6.3.7	Material handling equipment for unloading and offloading.	X	
6.3.8	Materials site storage.	X	
6.3.9	Removal of temporary site facilities upon completion.	X	X
6.3.10	Cleaning of the site upon project completion.	X	X
6.4	Testing and Commissioning		
6.4.1	Mechanical acceptance.	X	
6.4.2	Tests with & without interconnection for hydro commissioning.	X	
6.4.3	Testing and commissioning.	X	
6.4.4	Performance test.	X	
7	Other (Delivery, Production, etc)		
7.1	Delivery and packing, crating FOB to job site.	X	
7.2	Attic stock.		X
7.3	Road access, crane operation area, or parking permits.		X
7.4	Traffic diversion/control fees.		X
7.5	Architectural responsibility pertaining to fire, sound, and insulation. (remains in architect's scope of work).		X



PROJECT AGREEMENT INCLUSIONS & EXCLUSIONS

ITEM NO.	TASKS	MITREX	CLIENT
7.6	Independent inspections such as geotechnical conditions, concrete, reinforcing steel (re-bar), related materials, mortar, etc.		X
7.7	Perimeter foaming.		X
7.8	Performance mock-up.		X
7.9	Smoke seal.	X	
7.10	Acoustic sealants.		X
7.11	Costs associated with use of the material hoist and crane.		X
7.12	Construction of or supply of spray racks, chambers, water supply or any other material for field testing.		X
7.13	Final cleaning of railings, including removal of stickers/labels, and protective films.	X	X
7.15	All hoarding permits and public protection.		X
7.16	Supply and installation of any signage and provision to accommodate the same.		X
7.17	Provisions for acoustic insulation and sound dampening materials, either floor-to-floor or room-to-room.		X
7.18	Supply of exhaust boxes and vents. Connection of any mechanical components.		X
7.19	Responsibility of garbage disposal from site, maintenance of container, and container available on site.		X
7.20	Repair of damages made to products/structures by other sub-trades.		X
7.21	Preparation of installation areas covered by grass, interlocking, etc.		X



PROJECT OVERVIEW & EXPECTED OUTCOMES



CATEGORY:
Government Building
STATUS:
Completed


AREA:
10,000 SQFT


SAVING IN 30 YEARS:
\$ 624,000


SYSTEM SIZE:
160 kW



SAMPLE APPROVAL



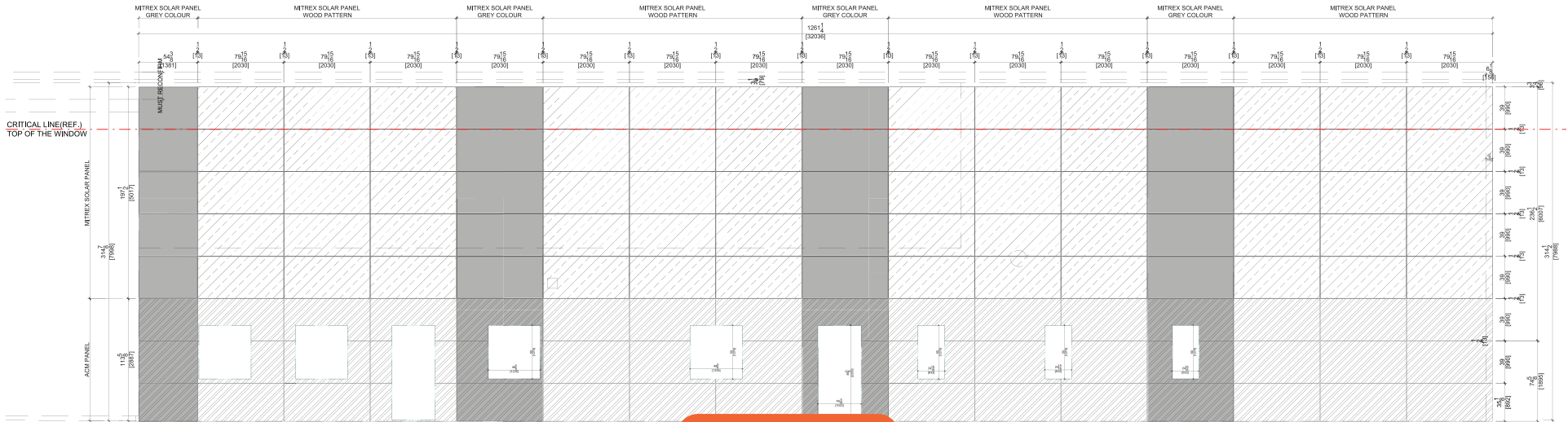
CATEGORY:
Solar Wood
NAME:
Nocciola



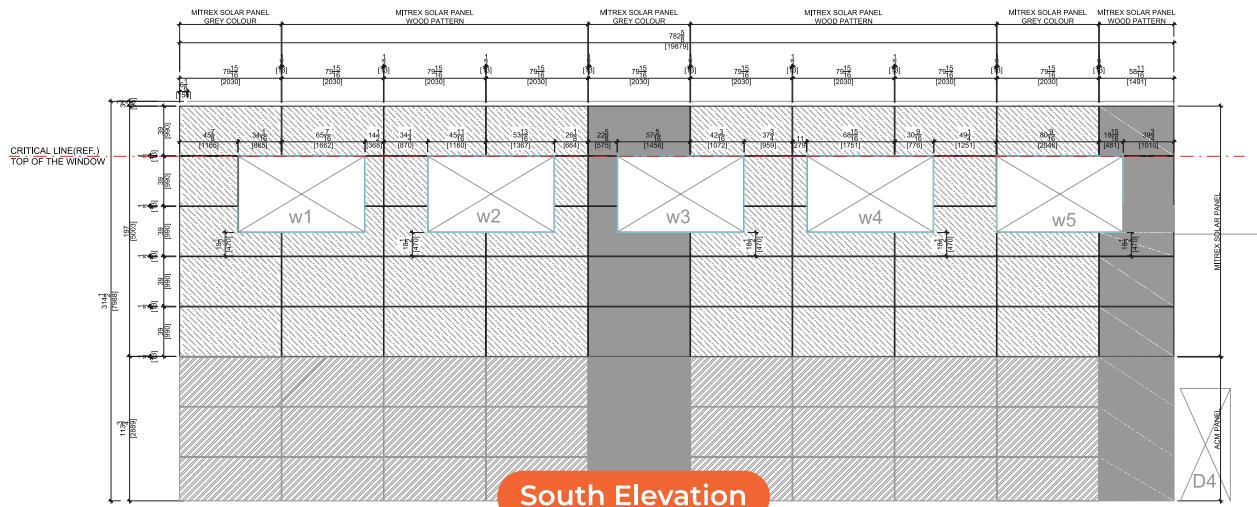
CATEGORY:
Solar Solid Colours
NAME:
Dark Grey



ARCHITECTURAL DRAWING



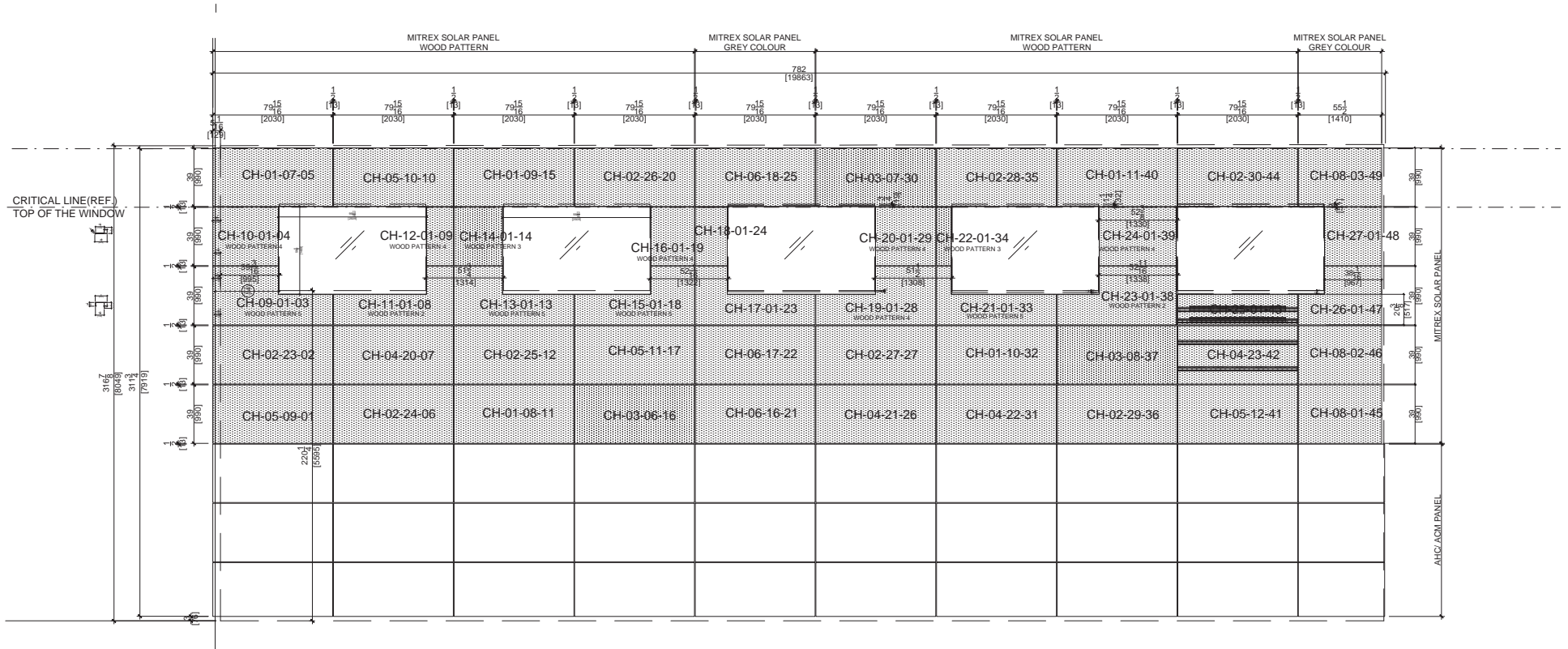
West Elevation



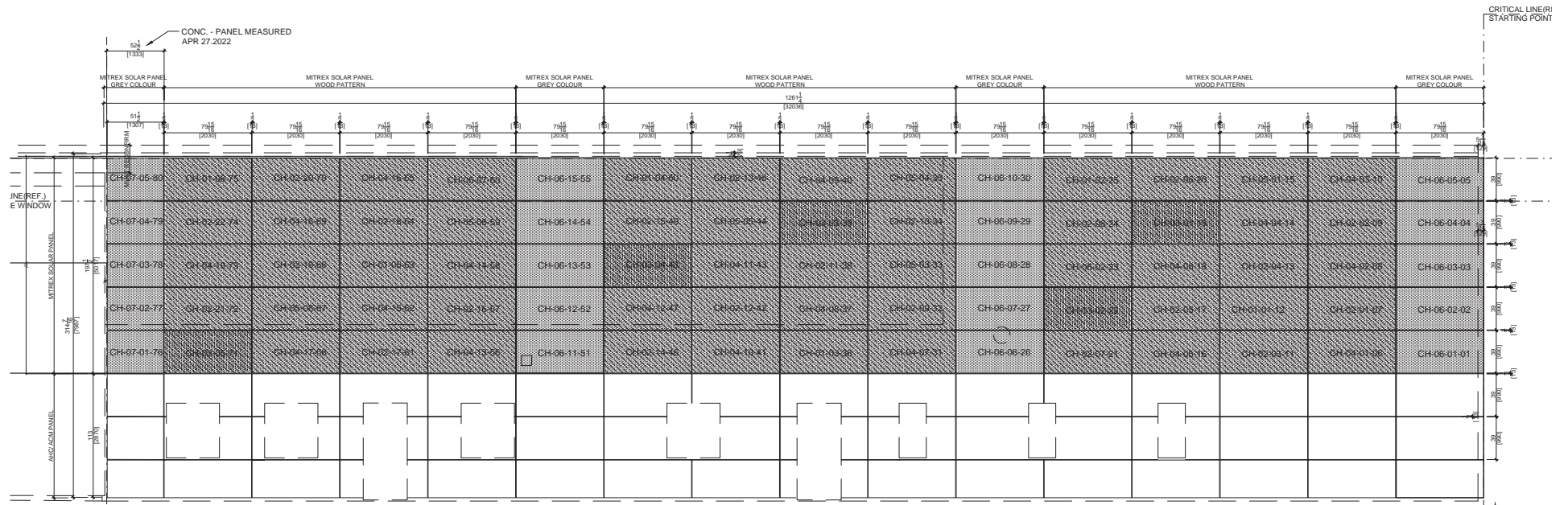
South Elevation

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PANEL LAYOUT: South Elevation




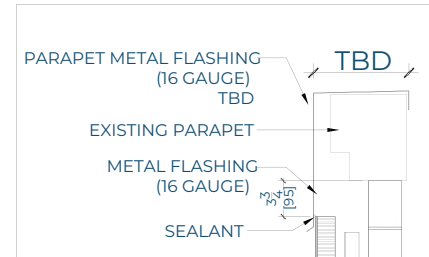
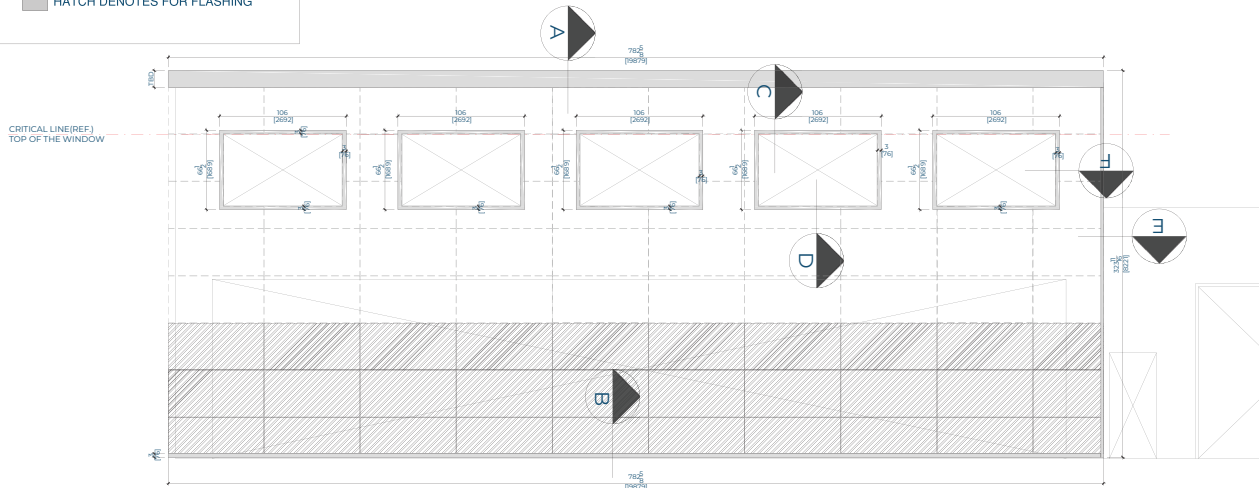
PANEL LAYOUT: West Elevation



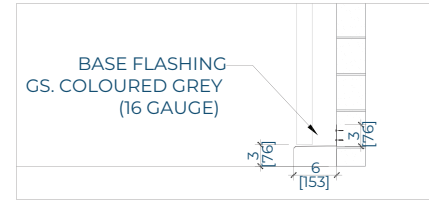
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FLASHING & WINDOW TECHNICAL DRAWING: South Elevation

GENERAL LEGEND:
 HATCH DENOTES FOR FLASHING

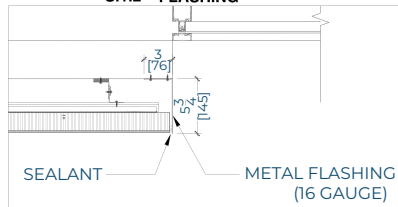


VIEW SECTION A

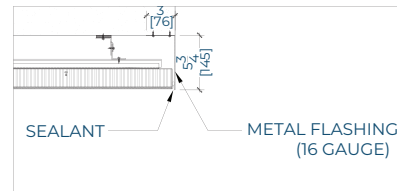


VIEW SECTION B

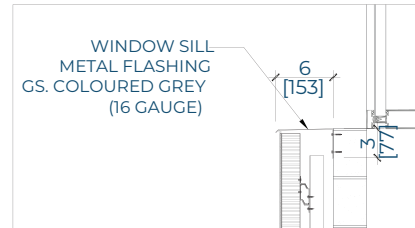
01 SOUTH ELEVATION - 605 YONGE ST.
 S.1.2 FLASHING



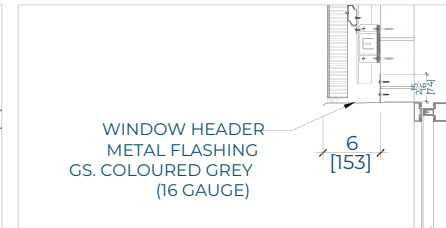
VIEW SECTION F



VIEW SECTION E

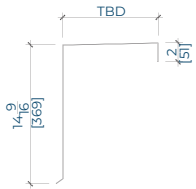


VIEW SECTION D

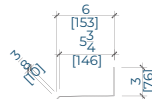


VIEW SECTION C

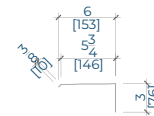
S.1.2 FLASHING



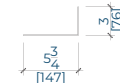
PARAPET FLASHING
66 LINEAR FEET



BASE FLASHING
66 LINEAR FEET
 WINDOW HEADER FLASHING
45 LINEAR FEET




WINDOW SILL FLASHING
45 LINEAR FEET

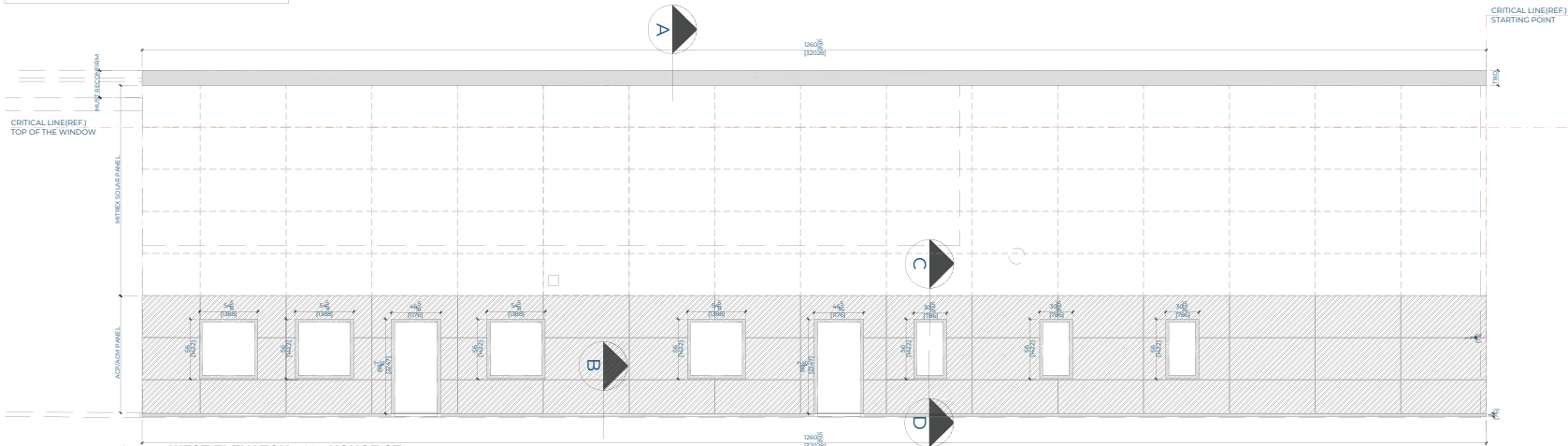


WINDOW SIDES FLASHING
56 LINEAR FEET

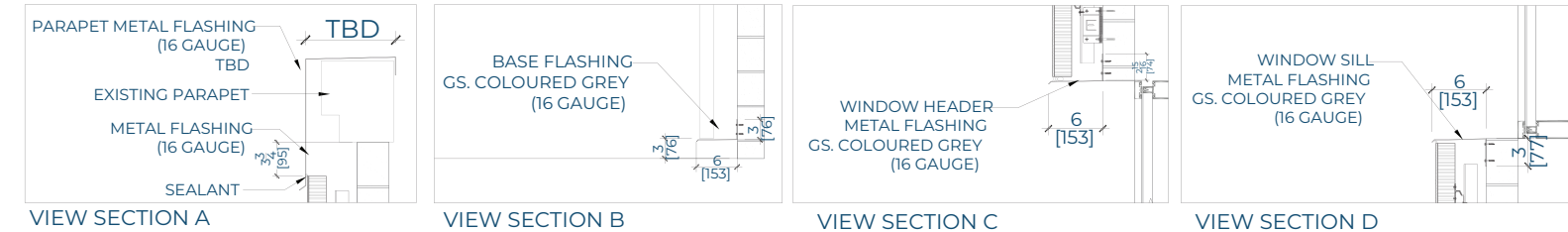
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FLASHING & WINDOW TECHNICAL DRAWING: West Elevation

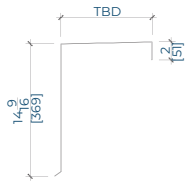
GENERAL LEGEND:
 HATCH DENOTES FOR FLASHING



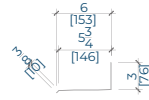
01 WEST ELEVATION - 605 YONGE ST.
 W.1.2 FLASHING



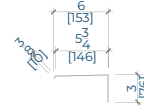
W.1.2 FLASHING



PARAPET FLASHING
 106 LINEAR FEET

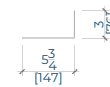


BASE FLASHING
 106 LINEAR FEET



WINDOW HEADER FLASHING
 34 LINEAR FEET

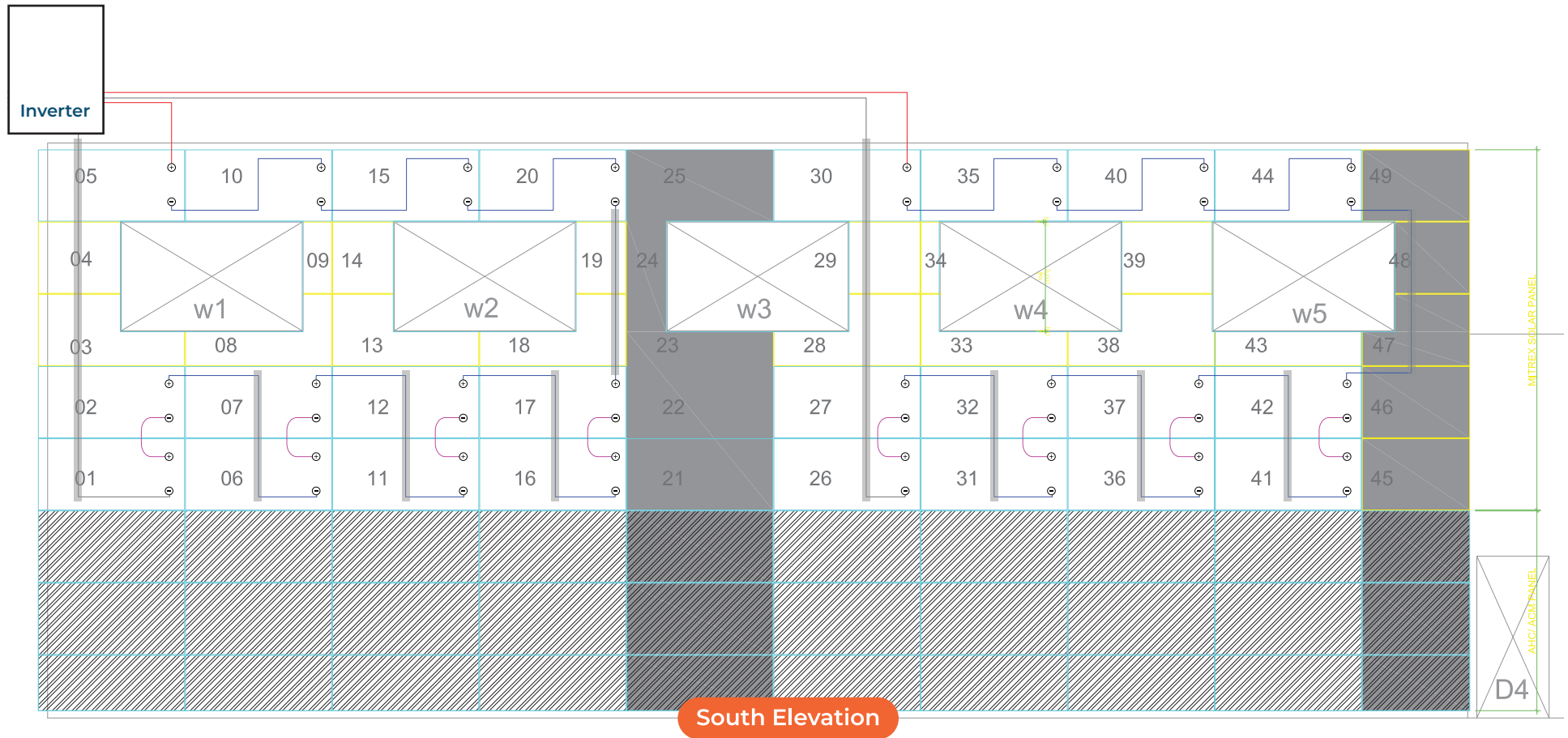
WINDOW SILL FLASHING
 27 LINEAR FEET



WINDOW SIDES FLASHING
 95 LINEAR FEET

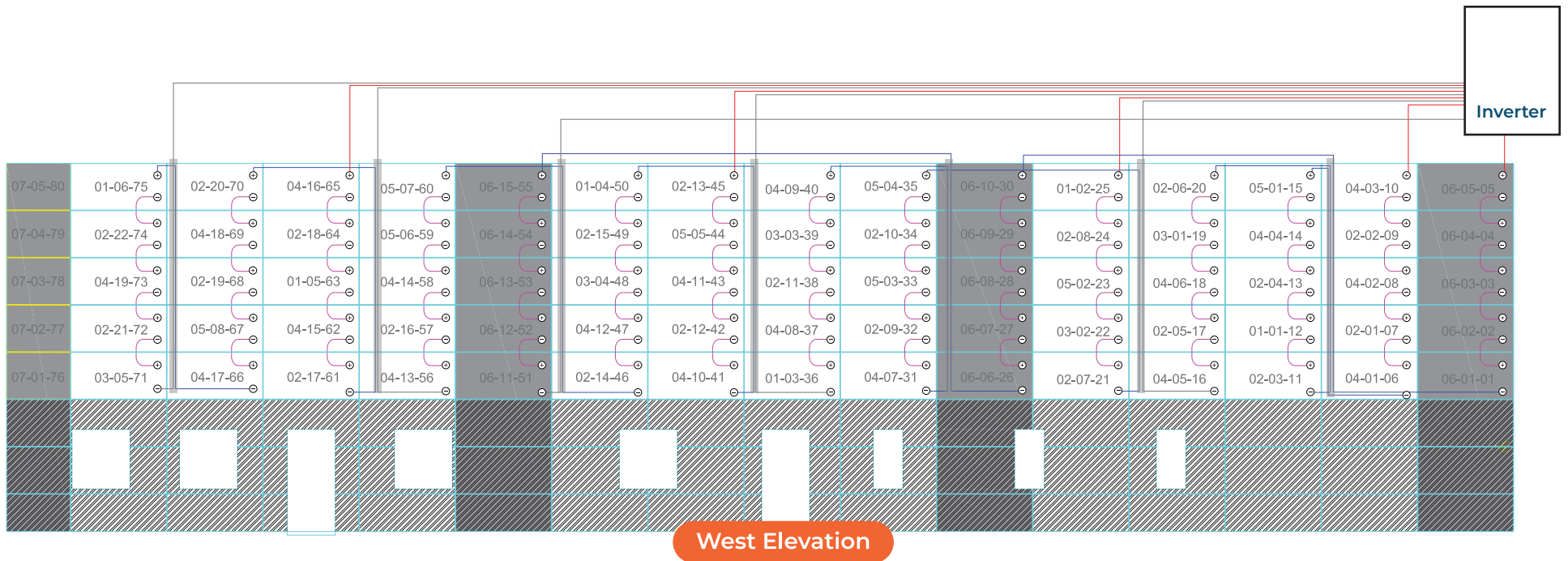
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ELECTRICAL DESIGN & WIRING PLAN: South Elevation



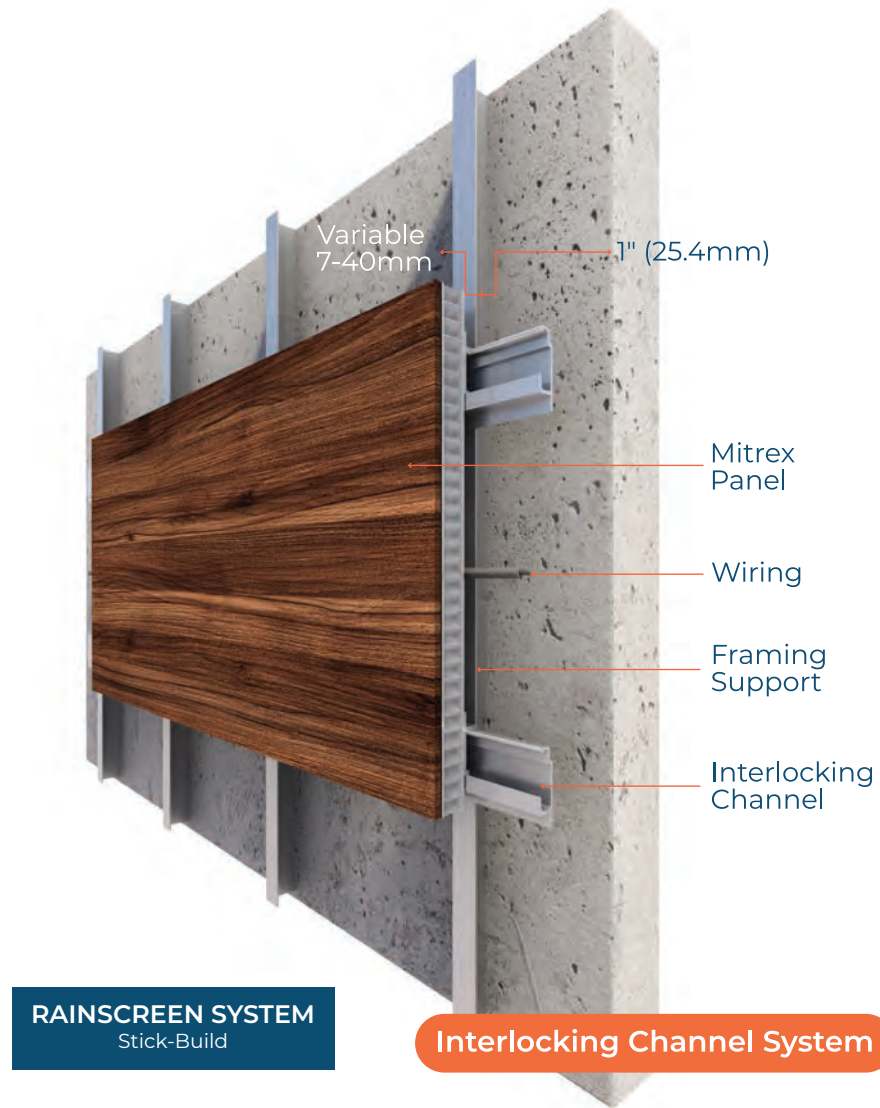
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ELECTRICAL DESIGN & WIRING PLAN: West Elevation



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MECHANICAL DESIGN: Rainscreen System

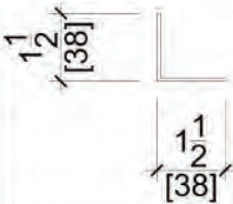


APPLICATION FOR ELECTRICAL CONNECTION & ENGINEERING DESIGN

APPLICATION NAME	SUBMITTED TO/ DONE BY
1.1. PRE-ASSESSMENT	Local Distribution Company (LDC)
1.2. CURRENT IMPACT ANALYSIS (CIA)	Local Distribution Company (LDC)
1.3. ELECTRICAL SAFETY AUTHORITY (ESA) PLAN REVIEW	Local Electrical Safety Authority (ESA)
1.4. ISSUE FOR CONSTRUCTION (IFC)/ ELECTRICAL DRAWING	Registered Electrical Engineer
1.5. ESA PERMIT	Local Electrical Safety Authority (ESA)
2.1. CONNECTION AUTHORIZATION	
2.2. FINAL CERTIFICATE BY ESA	
3.1. COMMISSIONING	Local Distribution Company (LDC)
3.2. FINAL CONNECTION AND METER INSTALLATION	Local Distribution Company (LDC)

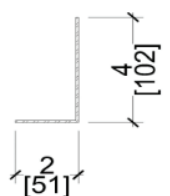
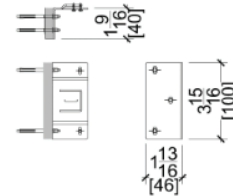


BILL OF MATERIAL & PROCUREMENT

PROJECT:		605 Yonge St. Midland ON. - COURTHOUSE		V4	
					Date: 3/22/2022
PANELS:					
SYS. DEPTH (INCH)	MATERIALS	DESCRIPTION	MAX. SIZE	SQ.FT	
6 1/8	MITREX GLASS PANEL(WOOD PATTERN)	1/8" THICK - Q=95 PCS.	39"X79 15/16"	1.893	
6 1/8	MITREX GLASS PANEL(GREY COLOUR)	1/8" THICK - Q=35 PCS.	39"X79 15/16"	659	
			TOTAL	2.552	
* Ref. shop drawings based on measurements					
SYSTEM SUB-FRAMING:					
SYSTEM SUB-FRAMING		DESCRIPTION	QTY		
INTERLOCKING CHANNELS FOR PANEL		1 " ALUMINIUM - ALLOY 6063 T6	1,520	L.F.	
INTERLOCKING CHANNELS FOR WALL		1 " ALUMINIUM - ALLOY 6063 T6	1,685	L.F.	
THERMALLY BROKEN BRACKET		TYPE 1	835	PCS	
L-ANGLE		1.5" X 1.5"	1,485	L.F.	
L-ANGLE		4"X2"	840	L.F.	
TAPCON FROM L-BRACKET TO WALL-CONCRETE/BRICK		HEX HEAD 410 STAINLESS TAPCON -HEAD 1/2", LENGTH 1-3/4"	2,900	PCS	
SCREWS FROM L-BAR TO L-BRACKET		HEX HEAD # 10-3/4" - STAINLESS STEEL/NON CORRISON/EPOXY COATED	2,200	PCS	
SCREWS FROM L-BAR(4") TO L-BAR(4")		HEX HEAD # 10-3/4" - STAINLESS STEEL/NON CORRISON/EPOXY COATED	420	PCS	
SCREWS FROM INTERLOCKING CHANNEL TO L-BAR		HEX HEAD # 10-3/4" - STAINLESS STEEL/NON CORRISON/EPOXY COATED	1,892	PCS	
SCREWS FROM INTERLOCKING CHANNEL TO MITREX PANEL		BUTTERFLY RIVET 3/4" BALI-06-04. 3/16" GRIP RANGE 105-6MM	2,600	PCS	
To View All Fasteners, Choose From Drop-Down Menu...					
METAL MEMBER SPECIFICATION:					
L-ANGLE	LOCATION	LENGTH	DESCRIPTION	QTY (10 ft)	
	WEST & SOUTH ELEVATION	1.5"X1.5"	16 Gauge GS	149	PCS

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BILL OF MATERIAL & PROCUREMENT

L-ANGLE	LOCATION	LENGTH	DESCRIPTION	QTY (10 ft)	
	SOUTH ELEVATION	4"X2"	16 Gauge GS	84	PCS
THERMALLY BROKEN BRACKET	LOCATION	LENGTH	DESCRIPTION	QTY	
	WEST & SOUTH ELEVATION	3 15/16"X1 13/16"X1 9/16"		835	PCS

INSULATION:			
INSULATION	TYPE	DESCRIPTION	QTY
N/A			SQFT
SPRAY COLOR			SQFT
N/A			
MEMBRANE / WATER PROOFING:			
VPB			QTY
			N/A
TAPE FLASHING TAPE SEAL CAULKING SEALANT			QTY
SEALANT - DOWSILL CONTRACTING			1100 LNFT.
CAULKING			
CAULKING-COLOURED TBD			1500 LNFT.

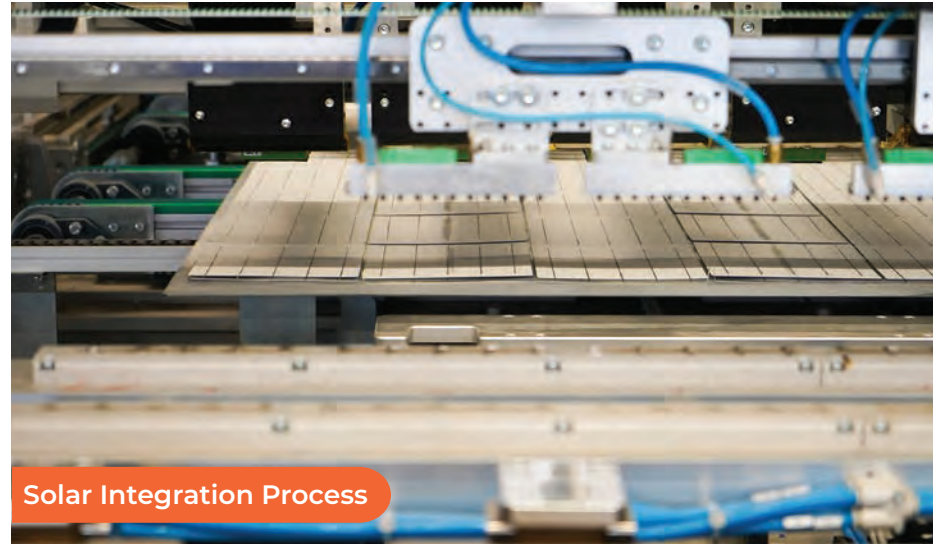
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BILL OF MATERIAL & PROCUREMENT

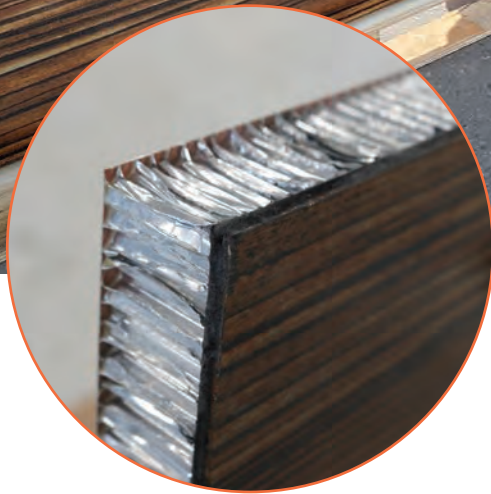
METAL FLASHING:					
TYPE	MEASUREMENTS	LOCATION	DESCRIPTION	QTY LFT	FINISH
F1		BASE FLASHING 16 GAUGE GALVANIZED STEEL	6" X 3"	220 L.F	
F2		WINDOW SILL FLASHING - 16 GAUGE ALUMINIUM - COLORED IN DARK GRAY	6" X 3"	90 L.F	
F3		WINDOW SIDES/ RETURNS FLASHING - 16 GAUGE - ALUMINIUM COLORED IN DARK GRAY	5 3/4" X 3"	170 L.F	
F4		WINDOW HEADER FLASHING - ALUMINIUM - COLORED IN DARK GRAY	6" X 3"	90 L.F	

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FABRICATION



PRODUCED PANEL



MITREX	
<small>11500 Hwy. 7, Suite 200, Oakville, Ontario L6L 1Y1, Canada www.mitrex.com</small>	
MODEL TYPE	MITR-16L1010
Maximum Panel Depth (D)	10'
Maximum Panel Width (W)	10'
Maximum Panel Volume (V)	1000'
Max. Panel Weight (Gross)	10000'
Max. Panel Weight (Net)	8000'
Maximum Recommended Spacing (S)	16'
<small>As shown on DTS 1 - 10/16/18 & 1-15-19/20 Approved for use in accordance with CAN/CSA A-157.1-19 Approved for use in accordance with CAN/CSA A-157.2-19</small>	
VOLUNTARY ELECTRICAL RATINGS	
<small>Approved for use in accordance with CAN/CSA A-157.1-19 Approved for use in accordance with CAN/CSA A-157.2-19</small>	
 	
MADE IN CANADA	

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PACKAGING & TRANSPORTATION



Truck Transportation



Box Packaging



Box Packaging

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ON-SITE MACHINERY REQUIRED



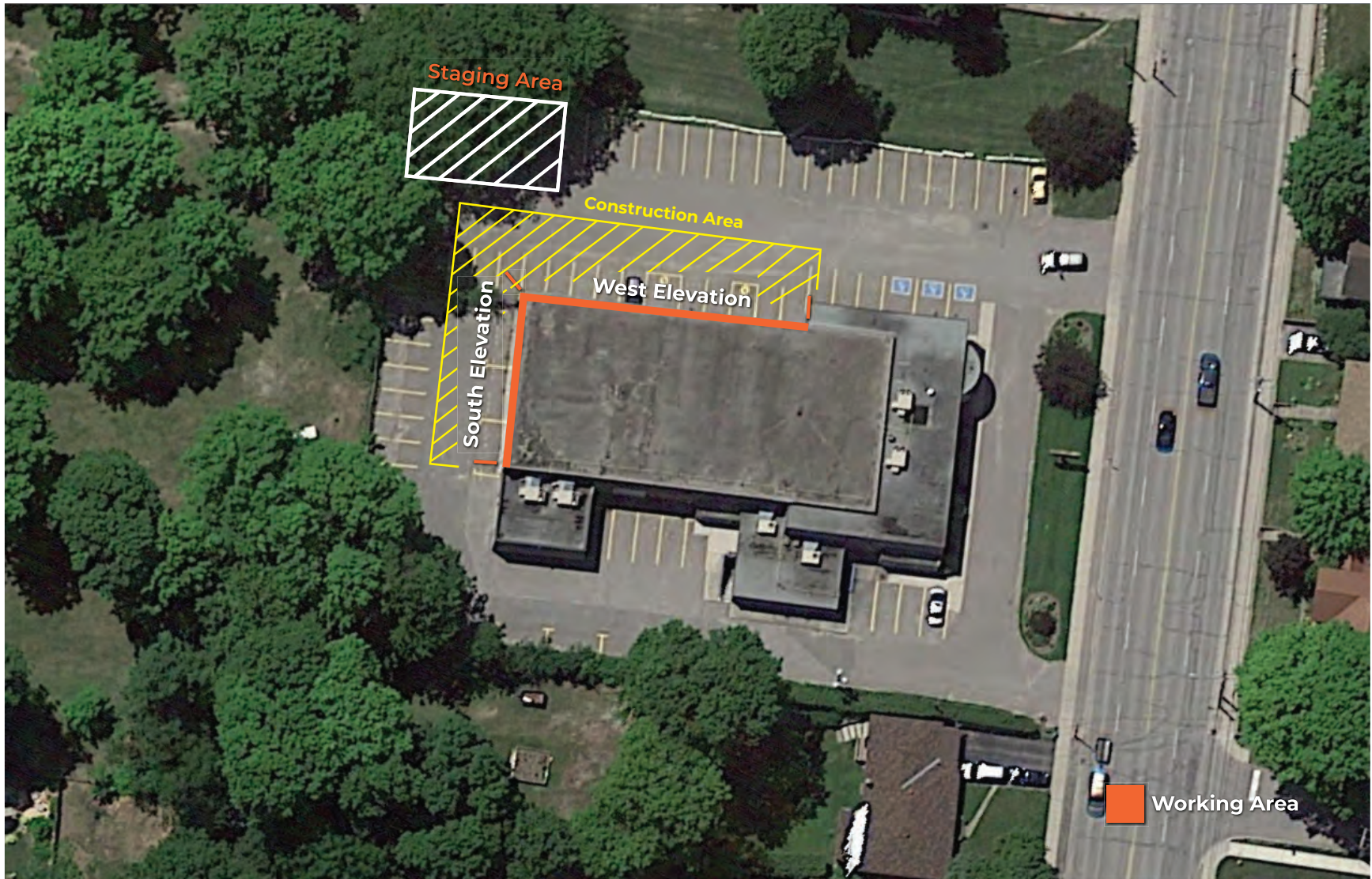
40' SCISSOR LIFT

With a raised height of 40' and a large platform workspace—this Scissor Lift will assist our installers during the installation process for quick and easy access.

On-site machinery requirement depends on the project.



JOB SITE PLANNING & STAGING AREA



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INSULATION & WALL PREPARATION



Insulation and wall preparation if needed.



THERMALLY BROKEN BRACKET INSTALLATION



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VERTICAL L-ANGLE INSTALLATION



16 Gauge CS - 1.5" x 1.5" L-Angle

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INTERLOCKING CHANNEL INSTALLATION



1" Aluminum - ALLOY 6063 T6

Space between wall and interlocking channel for wiring.

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CONDUIT INSTALLATION



DC cable for panel connection.



1 1/4" PVC electrical conduit.

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CONDUIT INSTALLATION



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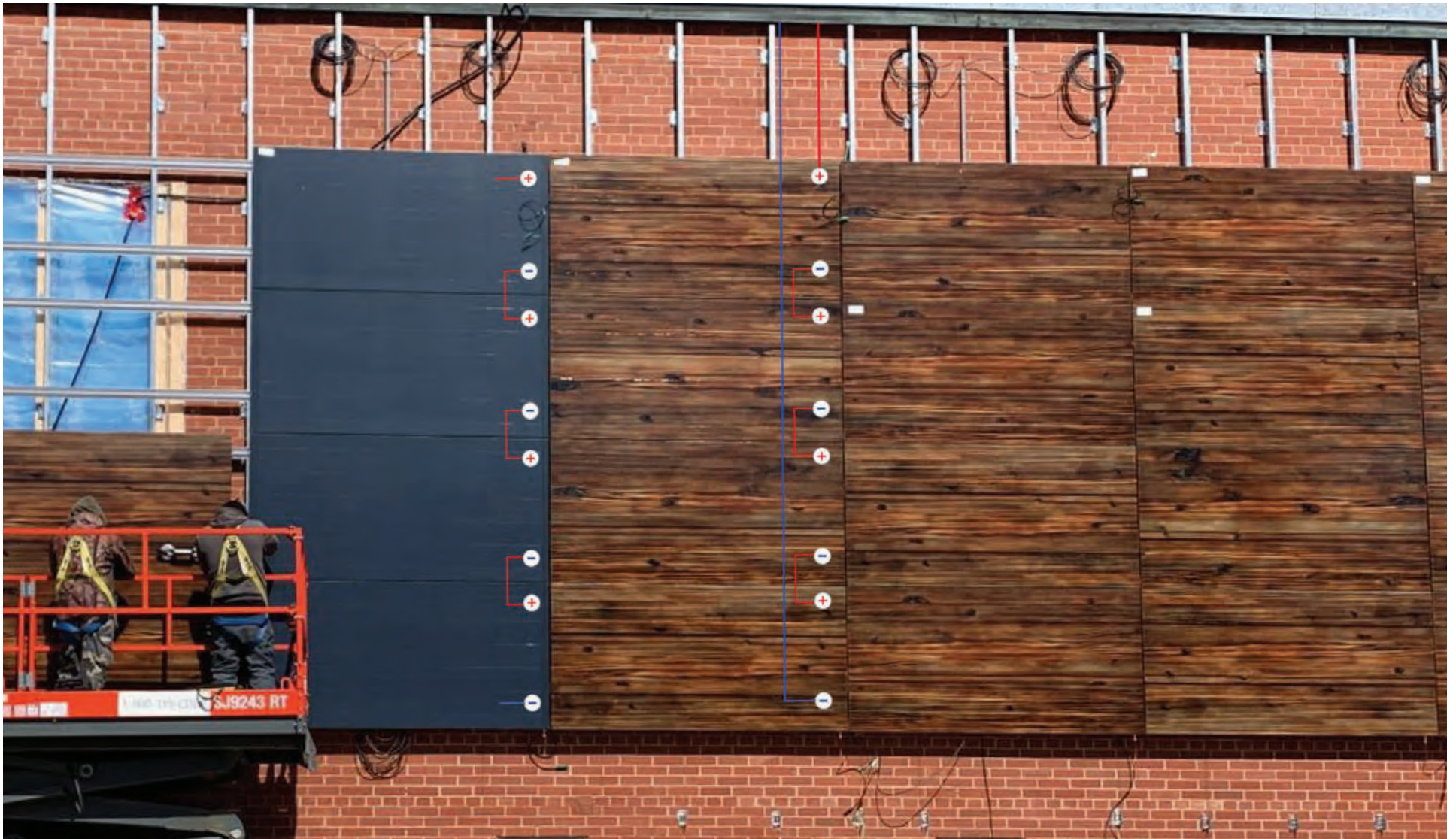
PANEL INSTALLATION



Interlocking Channels Attachment System.

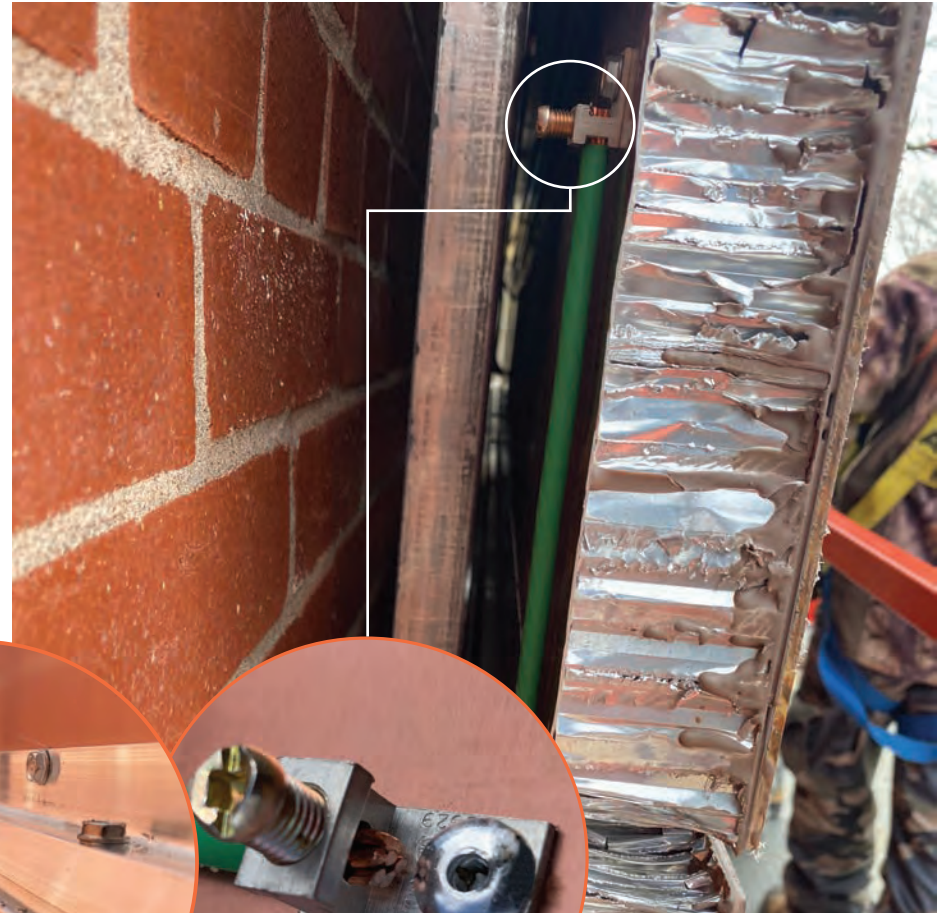
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ELECTRICAL CONNECTION BETWEEN PANELS



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GROUNDING THE PANELS



Grounding methods

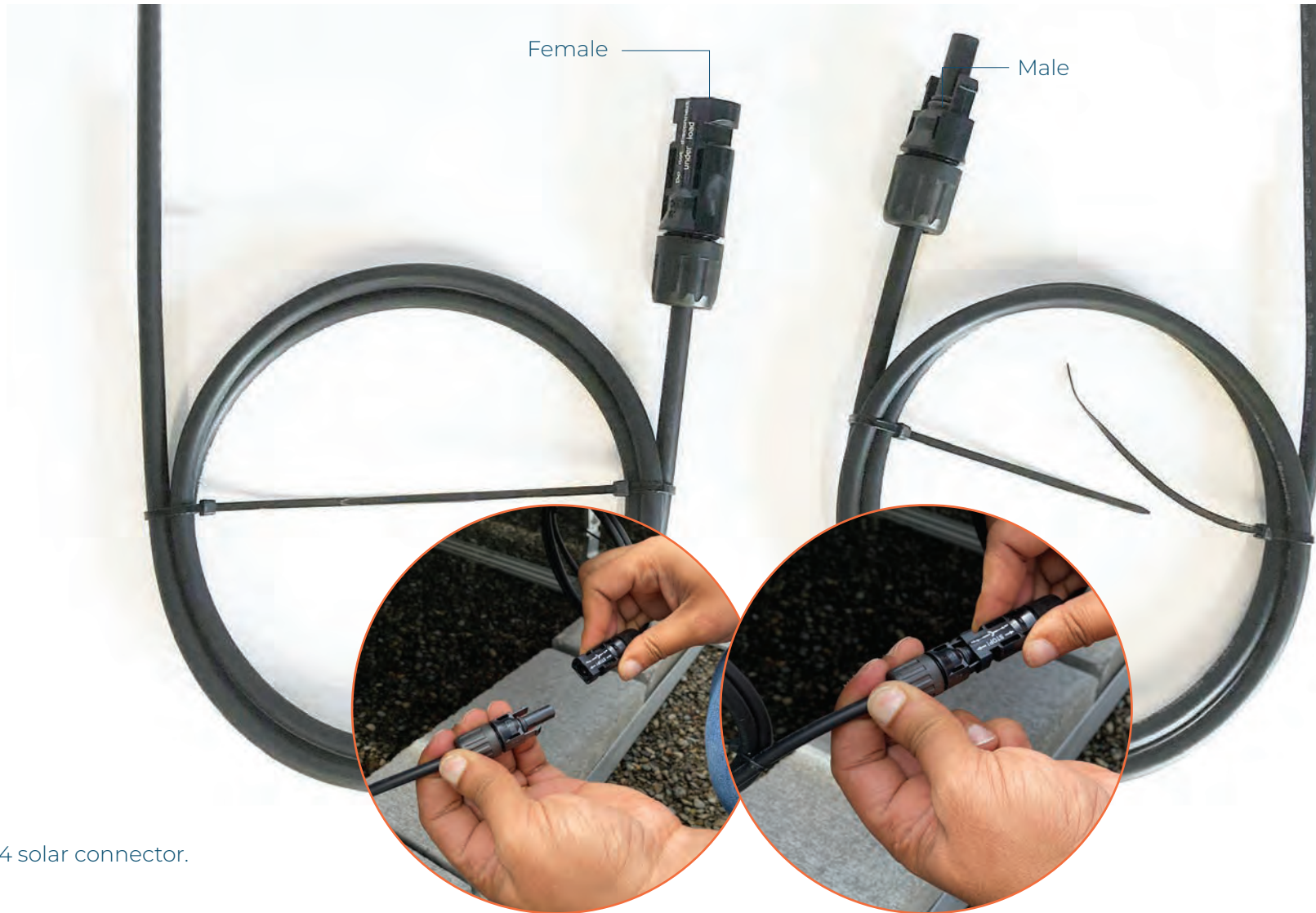
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PANEL WIRING



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ELECTRICAL CONNECTIONS - PANEL TO PANEL



MC4 solar connector.

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ELECTRICAL CONNECTIONS - PANEL TO PANEL



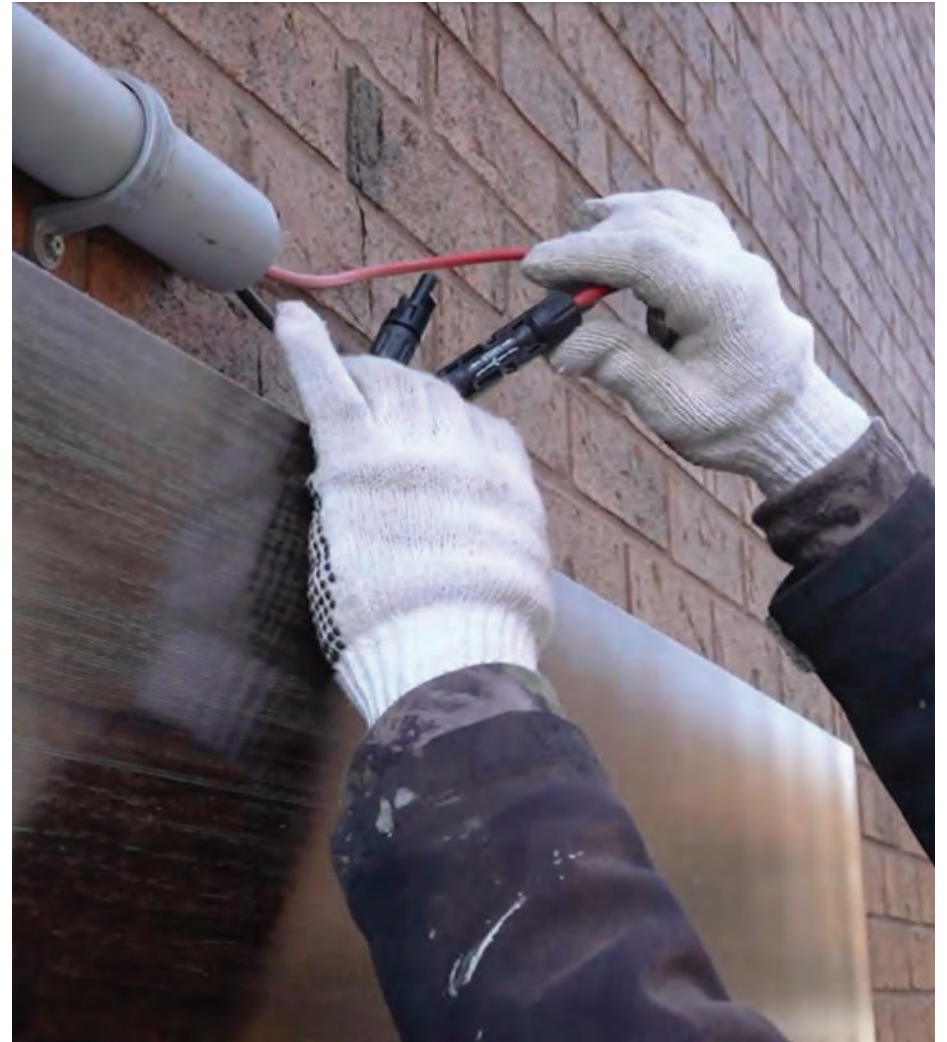
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ELECTRICAL CONNECTION INSTALLATION



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ELECTRICAL CONNECTION INSTALLATION



Panel to panel wiring hid behind the panels & run through conduit.

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HOME RUN CABLE TO INVERTER CONNECTION



Panel to panel wiring run to the roof, through the conduits.

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HOME RUN CABLE TO INVERTER CONNECTION LOCATION

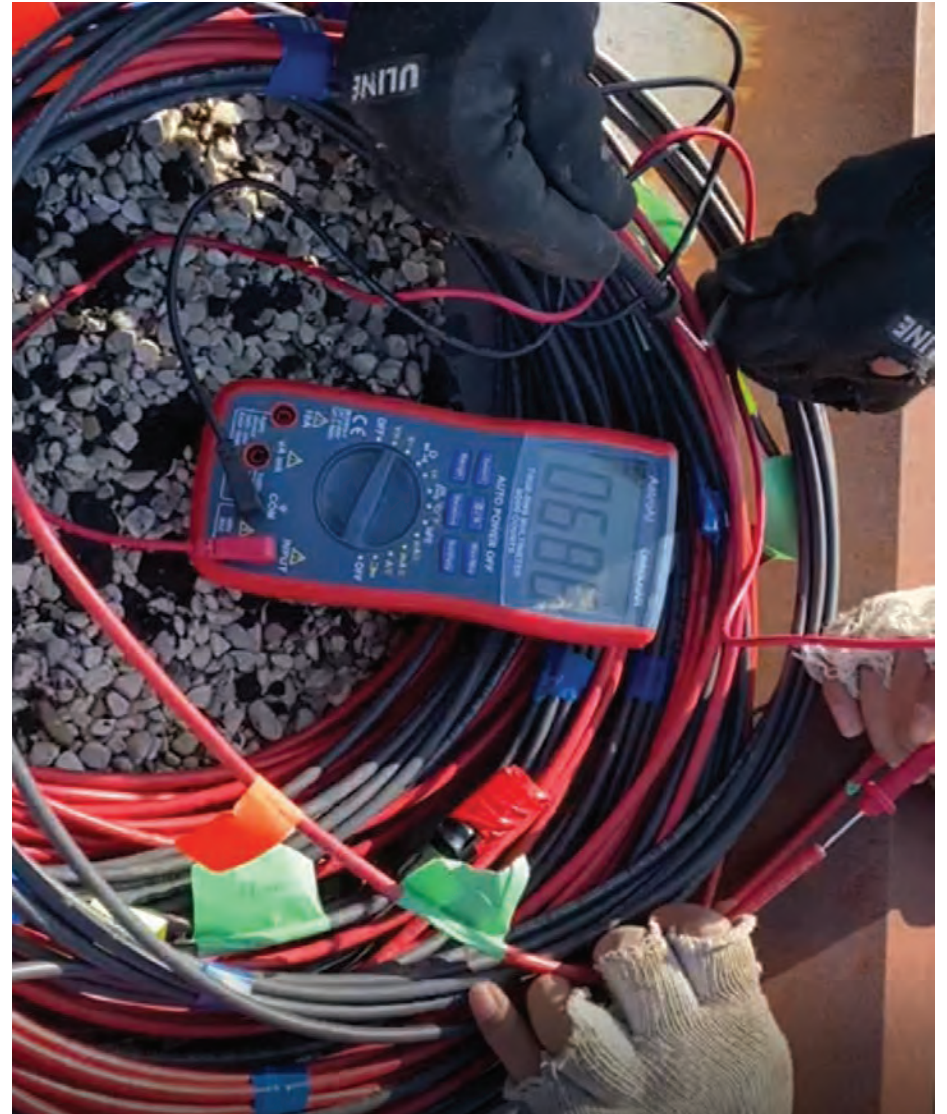


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ELECTRICAL SYSTEM VERIFICATION



Testing Voc of Facade Solar Panels



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ELECTRICAL CONNECTIONS - PANEL TO INVERTER

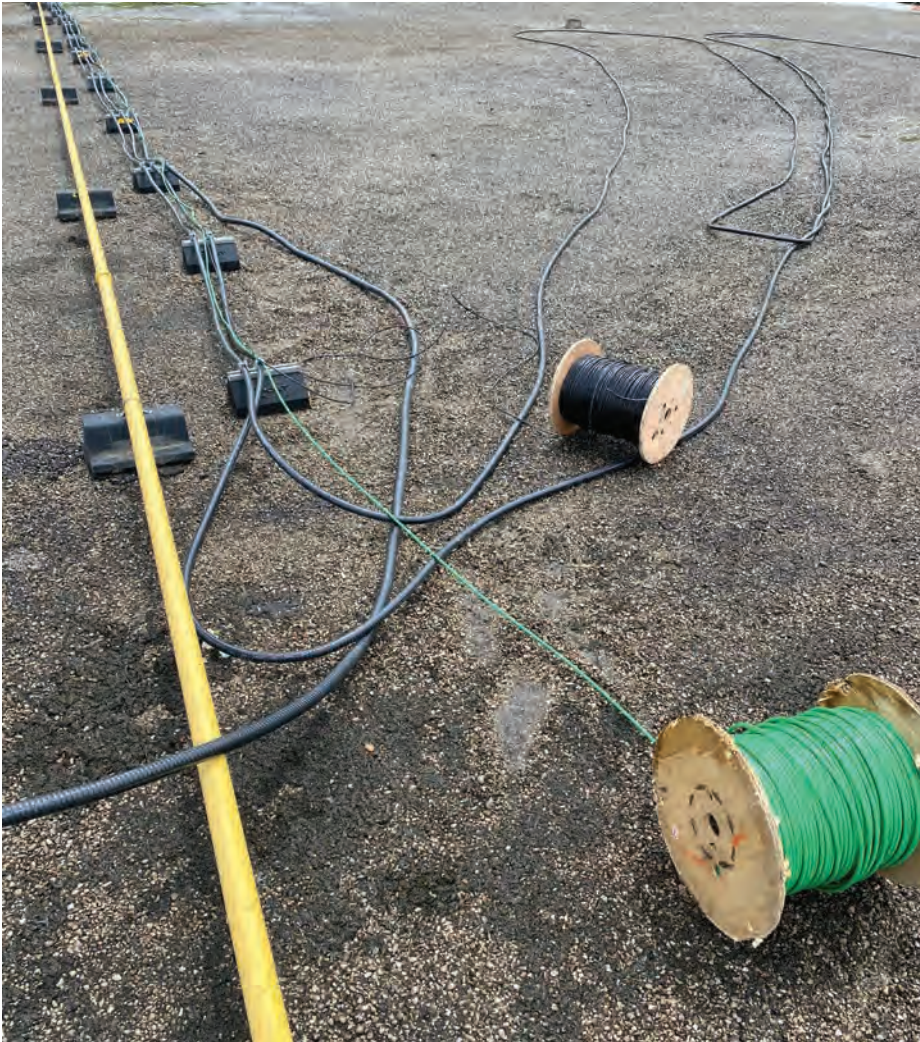


Wiring Set Up To The Building



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ELECTRICAL CONNECTIONS - ELECTRICAL ROOM



Wiring run to the electrical room.



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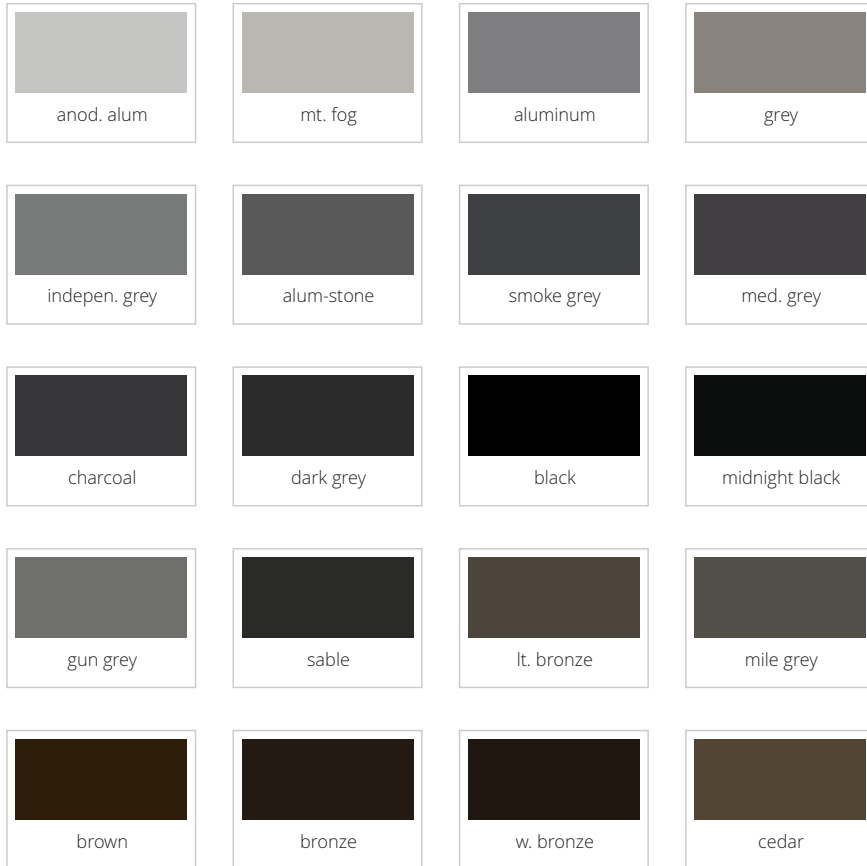
INSTALLATION OF OTHER AREAS (If Needed)



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JOINTS & CAULKING: Different Options Available

CS2 Colour Chart Dow CWS



CS2 Construction Sales Inc.
 Unit #103 - 20 Champlain Blvd. Toronto, ON M3H 2Z1
 416-398-0223 | info@cs2sales.com
 www.cs2sales.com
These colours are representative of actual colours. Please contact CS2 to purchase a physical sample binder.

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JOINTS & CAULKING: Different Options Available



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WHERE THE ELECTRICITY GOES



Electricity grid.



Goes back to the building.



Other applications - EV charger.



THIS BUILDING IS POWERED BY SOLAR FACADE

THE ENVIRONMENTAL IMPACT OF THIS SOLAR FACADE IN 30 YEARS IS:



ENERGY GENERATED:
Produces 1,950,000 kWh of energy



CARBON EMISSIONS:
Equivalent weight of 345 elephants



ELECTRICITY IN HOMES:
Can power 269 single family homes



TREES PLANTED:
800,000 trees planted



GASOLINE CARS:
300 gasoline cars off the road



EV CARS:
To charge 20,000 electric vehicles

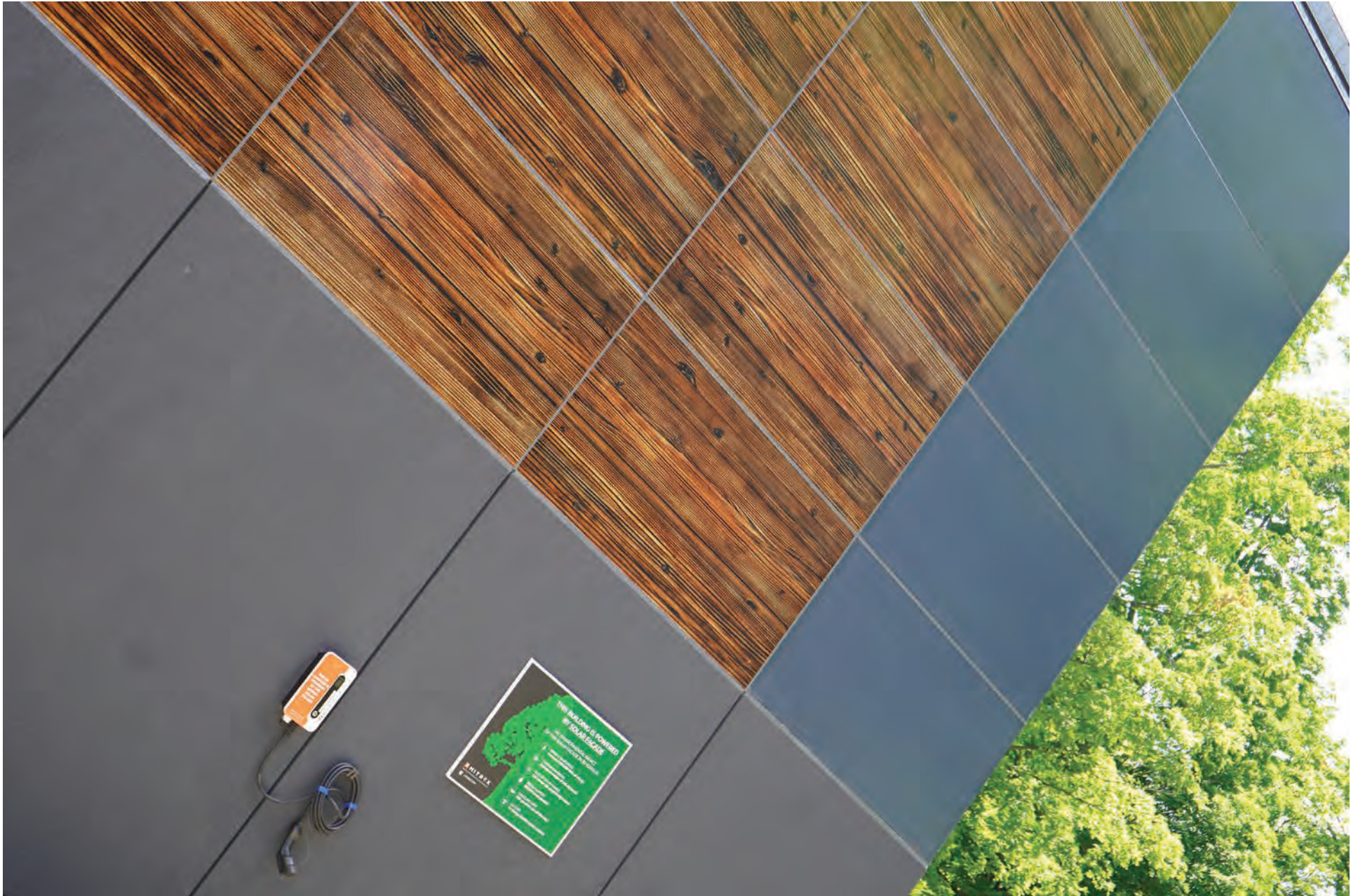




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PROJECT PROGRESS REPORT

Midland Court House

605 Yonge St, Midland, ON L4R 2E1, Canada

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 +1-416-497-7120

 info@mitrex.com

 41 Racine Rd., Toronto, ON M9W 2Z4

 mitrex.com