CG·ID
Innovative Design in Architecture

BIDDERS BULLETIN

PROJECT: Holyoke Community Childcare

Holyoke, Colorado

BULLETIN NUMBER

BB-1

ISSUED BY:

Brian Jensen

PROJECT #: 21-1139

DATE ISSUED: September 3rd, 2024

This bulletin is issued by the Architect to all known bidders before receipt of proposals, for the purpose of explaining, interpreting, or modifying the original plans and specifications. When enumerated by the bidder upon the proposal sheet, the information or instructions given hereon will be equally binding upon all parties as if included in the original plans and specifications.
BIDDER MUST ENTER THE NUMBER OF THIS BULLETIN ON HIS PROPOSAL SHEET

GENERAL INFORMATION

BB-1, ITEM #1; General

*Attached is the sign in sheet from the pre-bid meeting.

*Bidding contractor is to provide paving, base, dirt work and grading for the cul-de-sac scope shown on civil drawings. This scope of work shall be a separate line item on the final bid as this scope of work will be split with the adjoining landowner(s) so a price needs to be broke out in order to split up the cost for reimbursements to the owner.

*The owner is to furnish only the dirt by the truck load to the site. ALL removal, compactions, lifts, final grading, etc. shall be the responsibility of the biding contractor.

*The City of Holyoke will open and announce all sealed bids during a public meeting on September 13th, 2024, at 4:15 P.M. MT at 407 East Denver Street, Holyoke CO, 80734 in the council chambers.

*Sealed bids are allowed to be either mailed or hand delivered to the City of Holyoke prior to bid due date and time outlined.

*All building permits and tap fees will be waived by the Holyoke City Council.

*Provide separate document within bid package indicating the 3 similar projects as outlined in General Conditions.

THE FOLLOWING ITEMS ARE APPLICABLE TO THE SPECIFICATIONS

BB-1, ITEM #2; Bid Forms

*Bids shall be submitted on the attached revised Bid Form and Bid Proposal Forms.

BB-1, ITEM #3; Section 09 96 46 Intumescent Painting of Gypsum Board and Wood

*Specification section was added in its entirety. Coordinate with comments below.

BB-1, ITEM #4; 10 14 23 Signage

*Clarification on signage on this project. Contractor responsible for signage (signs) at locations identified under 2.2; B; 4 per this specification section. All other signage (signs) is to be by owner as noted in section 01 11 16.

BB-1, ITEM #5; 01 22 00 Unit Cost; Updates on some items (Installed)

*Vinyl base shall be calculated throughout the entire facility
*Unit Cost for p-lam countertops: $55/LF
*Unit Cost for tall cabinets & wardrobe cabinets: $375/LF
*Unit Cost for solid surface window sills: $38/LF
*Base Cabinets: $175/LF

BB-1, ITEM #6; Section 01 23 00 Alternates

*Attached is an updated spec section with updated alternates and information.

THE FOLLOWING ITEMS ARE APPLICABLE TO THE DRAWINGS

BB-1, ITEM #7; Sheet C1.2 Site Plan

*Refer to attached sheet C1.2 for clarifications on what utilities shall be furnished and installed by the bidding contractor.

BB-1, ITEM #8; Sheet AC-101 Main Level Reflected Ceiling Plan

*Gypsum ceilings within all 1-hour fire rated rooms (113, 129, 131, 132, 133, 134) shall have 1-hour intumescent fire paint rated for gypsum. Refer to attached specification 09 96 46

*Gypsum ceiling within all 2-hour fire rated room (133a) shall have 2-hour intumescent fire paint rated for gypsum. Refer to attached specification 0 96 46

*Ceiling access hatch in rooms 113 & 129 are allowed to be 1-hour fire rated insulated door in an up-swing style in a 22”x30” size to fit between roof trusses.

*Ceiling noted to be (2) layers of type “X” GWB in room 133a shall only be 1 layer and NOT 2 layers, with application of 2-hour intumescent fire paint to maintain an actual 2-hour rated ceiling. Follow specifications.

BB-1, ITEM #9; A-601 Door & Frame Elevations and Schedule

*All exterior windows shall have solid surface window sills with gypsum board wrapped sides and head. Provide unit cost for the solid surface sills indicated above.

BB-1, ITEM #10; S-501 Structural Details

*Detail 6 to apply at all mechanical piping and electrical conduit at elevations within 2’-0” and above of the bottom of grade beam or continuous footing construction.

END OF BB-1

See attached for MEP addendum items following the architectural, structural, and civil items.

CG·ID
Innovative Design in Architecture

PRE-CONSTRUCTION SIGN-IN SHEET

PROJECT: Holyoke Community Childcare
New Daycare

DATE: 8-23-2024

TIME: 1:00 PM MT

PROJECT #: 21-1139

	Name	Company	Email or Phone
1.	BRIAN JENSEN	CGID	brianjensen@cgidarch.com
2.	Jeremy Klima	SES	jklima@specializedeng.com
3.	John Flanagan	FCI	wyobids@fciwyllc.com
4.	JEREMY THOMPSON	CITY OF HOLYOKE	SUPT@CITYOFHOLYOKE-CO.GOV
5.	Cathy Edge	City of Holyoke council member	rcedge318@ptci.com.coop
6.	Mike Smith	Mike Smith Const. Inc	mscinc@ptelcon.coop
7.	Zach Anderson	Steele's Construction	Zach@Steelesconstruction.com
8.	Tom Bennett	First Risers	tbennett@firstrisers.net
9.	LUKE GOLDENSTEIN	ANCHOR ROOFING	~~luke.goldenstein@~~
10.	Trisha Herman	HCC holyokechildcare gmail.com	luke.anchorroofing@gmail.com
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR BASE BID

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

BASE BID

Specification Section	**Description**	**Total**
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR ALTERNATE #1

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #1 – Add Needlepoint Bipolar Ionization – See MEP Drawings

Specification Section	**Description**	**Total**
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR ALTERNATE #2

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #2 – Add Undercounter Lights in Classrooms – See Electrical Drawings

Specification Section	**Description**	**Total**
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR ALTERNATE #3

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #3 – Add Parking Lot Lighting – See Electrical Drawings

Specification Section	Description	Total
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

BID FORM – FOR ALTERNATE #4

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #4 – Add Site Lighting – See Electrical Drawings

Specification Section	**Description**	**Total**
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR ALTERNATE #5

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #5 – Fire Sprinkler System Deduct – See MEP Drawings

Specification Section	Description	Total
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

BID FORM – FOR ALTERNATE #6

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

CONTRACTOR:_____

CONTACT PERSON:_____

ADDRESS:_____

TELEPHONE #:_____

FAX #:_____

ALTERNATE #6 – Provide curb & gutter & fully paved parking lot – See Civil Drawings

Specification Section	**Description**	**Total**
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
_____	_____	$_____
	TOTAL BASE BID	$_____

BASE BID (written): _____

ADD FOR PERFORMANCE / PAYMENT BOND $_____

ADD BOND (written): _____

Addenda (List):

Clarifications (List) – If more space is required, please attach & indicate quantity of attached pages here

Contractor:_____

Name:_____

Title:_____

Date:_____

Holyoke Community Childcare
New Childcare Center
Holyoke, Colorado

PROJECT BID PROPOSAL

TO: City of Holyoke
Holyoke, Colorado

Project # 21-1139

The undersigned, having carefully examined the Instructions to Bidders, General Conditions and Supplementary Conditions, Specifications, addenda and associated bidding documents, as prepared by the Architect, CG·ID Architecture, as well as the premises and conditions affecting the work, proposes to furnish all materials and labor, machinery, tools and services necessary to perform the work as set forth in and in accordance with said documents for the lump sum amounts listed below.

Contractor shall fill out the Bid Forms and include them with this bid proposal form. Provide base bid number from bid form on indicated line below.

CONTRACTOR DISCIPLINE: _____

CONTRACTOR BASE BID: _____

ALTERNATE #1: _____

ALTERNATE #2: _____

ALTERNATE #3: _____

ALTERNATE #4: _____

ALTERNATE (DEDUCT) #5: _____

ALTERNATE #6: _____

Cul-De-Sac Scope: _____

The contract time will be _____ calendar days from the written date of Notice to Proceed.

Receipt of the following Addenda (Bid Bulletin) is hereby acknowledged: _____.

This Project Bid Proposal Form, along with the Bid Form(s) is to be mailed to City of Holyoke, Att. HCC Bid, 407 E. Denver Street, Holyoke, Colorado 80734 no later than 4:00PM MT on September 13th, 2024.

Respectfully Submitted,

Corporation Seal:

Bidder: _____

Signature: _____

Address: _____

_____

Date: _____

SECTION 01 23 00 – ALTERNATES

PART 1 – GENERAL

DESCRIPTION OF REQUIREMENTS

Definition: An alternate is an amount proposed by Bidders and stated on the Bid Form that will be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in either scope of work or in products, materials, equipment, systems or installation methods described in Contract Documents.

Coordination: Coordinate related work and modify or adjust adjacent work as required to ensure that work affected by each accepted alternate is complete and fully integrated into the project.

Notification: Immediately following award of Contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates, if any.

Schedule: A "Schedule of Alternates" is included at the end of this section. Specification sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the work described under each alternate.

Include as part of each alternate, miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.

ALTERNATES:

1: Needlepoint Bipolar Ionization. Add equipment and power connection to each furnace unit. Coordinate with Mechanical/Electrical drawings for additional information.

2: Provide under cabinet lights within all classrooms and activities space. Coordinate with electrical sheets for additional information.

3. Provide parking lot lighting. Coordinate with electrical sheets for additional information.

4. Provide site lighting. Coordinate with electrical sheets for additional information.

5. Provide deduct cost for fire sprinkler system. Coordinate with MEP sheets for additional information.

6. Provide cost for complete paved parking lot and perimeter curb & gutter. Base bid parking lot is gravel and concrete only at the ADA parking stalls. (base bid includes all other concrete listed; sidewalks, swale, transformer pad, etc) as indicated on C1.2.

END OF SECTION 01 23 00

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SECTION 09 96 46 – INTUMESCENT PAINTING OF GYPSUM BOARD AND WOOD

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Intumescent coating for fire protection of the following materials:
   1. Gypsum board.

1.2 REFERENCE STANDARDS

A. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

B. ASTM E 119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

C. ASTM E 2768 – Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test).

D. AWCI Technical Manual 12-B – Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire-Resistive Materials.

E. CAN/ULC-S101 – Standard Methods of Fire Endurance Tests of Building Construction and Materials.

F. NFPA 251 – Standard Methods of Tests of Fire Endurance of Building Construction and Materials.

G. UL 263 – Standard for Fire Tests of Building Construction and Materials.

1.3 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including surface preparation and application instructions.

C. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

D. Test Reports: Submit manufacturer's test reports from testing performed by qualified, independent testing laboratories.

E. Applicator's Project References: Submit applicator's list of successfully completed intumescent coating projects, including project name and location, name of architect, and type and quantity of intumescent coatings applied.

F. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 5 years, in the manufacturing of intumescent coatings of similar type to that specified.

B. Applicator's Qualifications:
   1. Applicator regularly engaged, for a minimum of 5 years, in application of intumescent coatings of similar type to that specified.
   2. Certified to measure wet film thickness and calculate dry film thickness.
   3. Employ persons trained for application of intumescent coatings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   3. Store materials in clean, dry area indoors.
   4. Store materials between 33 degrees F and 100 degrees F (1 degree C and 38 degrees C).
   5. Store materials out of direct sunlight.
   6. Protect materials from freezing.
   7. Protect materials during storage, handling, and application to prevent contamination or damage.

1.6 AMBIENT CONDITIONS

A. Maintain the following conditions during application and curing of intumescent coating:
   1. Coating Temperature:
      a. Minimum: 70 degrees F (21 degrees C).
      b. Maximum: 100 degrees F (38 degrees C).
   2. Surface Temperature:
      a. Minimum: 50 degrees F (10 degrees C).
      b. Maximum: 125 degrees F (52 degrees C).
   3. Air Temperature:
      a. Minimum: 50 degrees F (10 degrees C).
      b. Maximum: 110 degrees F (43 degrees C).
   4. Relative Humidity:
      a. Minimum: 0 percent.
      b. Maximum: 85 percent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Shield Industries, Inc., 131 Smokehill Lane, Woodstock, Georgia 30188. Toll Free 800-332-6327. Phone 770-517-6869. Fax 770-517-6863. Website

www.shieldindustries.com. Email marketing@shieldindustries.com.

B. Substitutions: Not permitted

2.2 INTUMESCENT COATING

A. Intumescent Coating for Gypsum Board and Wood: “ForceField FireGuard E-84” intumescent coating.
   1. Description:
      a. Water-based, thin-film intumescent coating for fire protection of gypsum board and wood.
      b. Creates fire-retardant and fire-resistant barrier on gypsum board and wood surfaces.
   2. Listed and Certified: Guardian Fire Test Laboratories, Inc.
   3. Color: White.
   4. Finish: Smooth, flat.
   5. Solids Content, by Volume: 54 percent.
   6. VOC Content: 3.6 g/L.
   7. Limitations:
      a. Do not use on exterior applications exposed to freeze/thaw cycling without topcoat.
      b. Do not use on long-term surface temperatures over 140 degrees F (60 degrees C).

B. Performance Data:
   1. Surface Burning Characteristics, ASTM E 84, 20 Min. Extended and ASTM E 2768: Class A.
      a. Flame Spread Index: 0.
      b. Smoke Developed Index: 5.
   2. Tested to ASTM E 119, UL 263 STD, NFPA 251, and ULC-S101: 1 and 2-hour on gypsum board and wood wall and floor/ceiling assemblies.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive intumescent coating.

B. Notify Architect of conditions that would adversely affect application.

C. Do not begin surface preparation or application until unacceptable conditions are corrected.

D. Pressure-Treated Wood:
   1. Moisture Content: Maximum 18 percent or as recommended by wood product manufacturer.
   2. Testing: Test moisture content with moisture meter before applying primer.

3.2 PREPARATION

A. Protection of In-Place Conditions: Protect adjacent surfaces from contact with intumescent coating.

B. Surface Preparation:
   1. Prepare surfaces in accordance with manufacturer's instructions.
   2. Remove dirt, dust, debris, oil, grease, loose particles, and other surface contaminants which could interfere with bonding of intumescent coating.
   3. Provide dry, sound substrate.
   4. Wood: Scrape off flaking paint from existing wood.

3.3 MIXING

A. Mix intumescent coating in accordance with manufacturer's instructions.

B. Do not thin intumescent coating.

3.4 APPLICATION

A. Apply intumescent coating to gypsum board and wood in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Primer:
   1. Apply intumescent coating over primer.
   2. Apply primer in accordance with primer manufacturer's instructions.

C. Application Rate: Apply intumescent coating at application rate in accordance with manufacturer's instructions.

D. Application Thicknesses:
   1. Wet Film Thickness: Maximum 25 to 30 mils per coat.
   2. Dry Film Thickness: Maximum 13.5 to 16.2 mils per coat.
   3. Meet or exceed requirements for protection level required.
   4. Total "DRY" film thickness required to be 30mil minimum for 2-hour rating
   5. Total "DRY" film thickness required to be 25mil minimum for 1-hour rating

E. Apply minimum of 2 coats of intumescent coating to reach required dry film thickness.

F. Apply each coat of intumescent coating evenly to ensure uniform coating thickness.

G. Apply next coat of intumescent coating when previous coats have cured and reached hardness in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

A. Wet Film Thickness: Make frequent thickness measurements with wet film gauge during application to ensure uniform coating thickness.

B. Dry Film Thickness:
   1. Measure final dry film thickness using electronic dry film thickness gauge in accordance with AWCI 12-B.
   2. Dry Film Thickness Gauge: "Positector 200" or comparable.

C. Certification: Submit certificate of application from an independent, certified testing agency to Architect certifying intumescent coating has been properly applied to specified dry film thicknesses per 3.4; D; 4 & 5.

3.6 ADJUSTING

A. Repairing Damaged Intumescent Coating:
   1. Rebuild required thickness of intumescent coating in accordance with manufacturer's instructions if coating becomes damaged.
   2. Abrade back damaged areas to a firm edge.
   3. Ensure surface is clean and dry before reapplying intumescent coating.

3.7 PROTECTION

A. Protect applied intumescent coating from damage during construction. Re-apply coating to all damaged areas and get re-tested.

END OF SECTION 09 96 46

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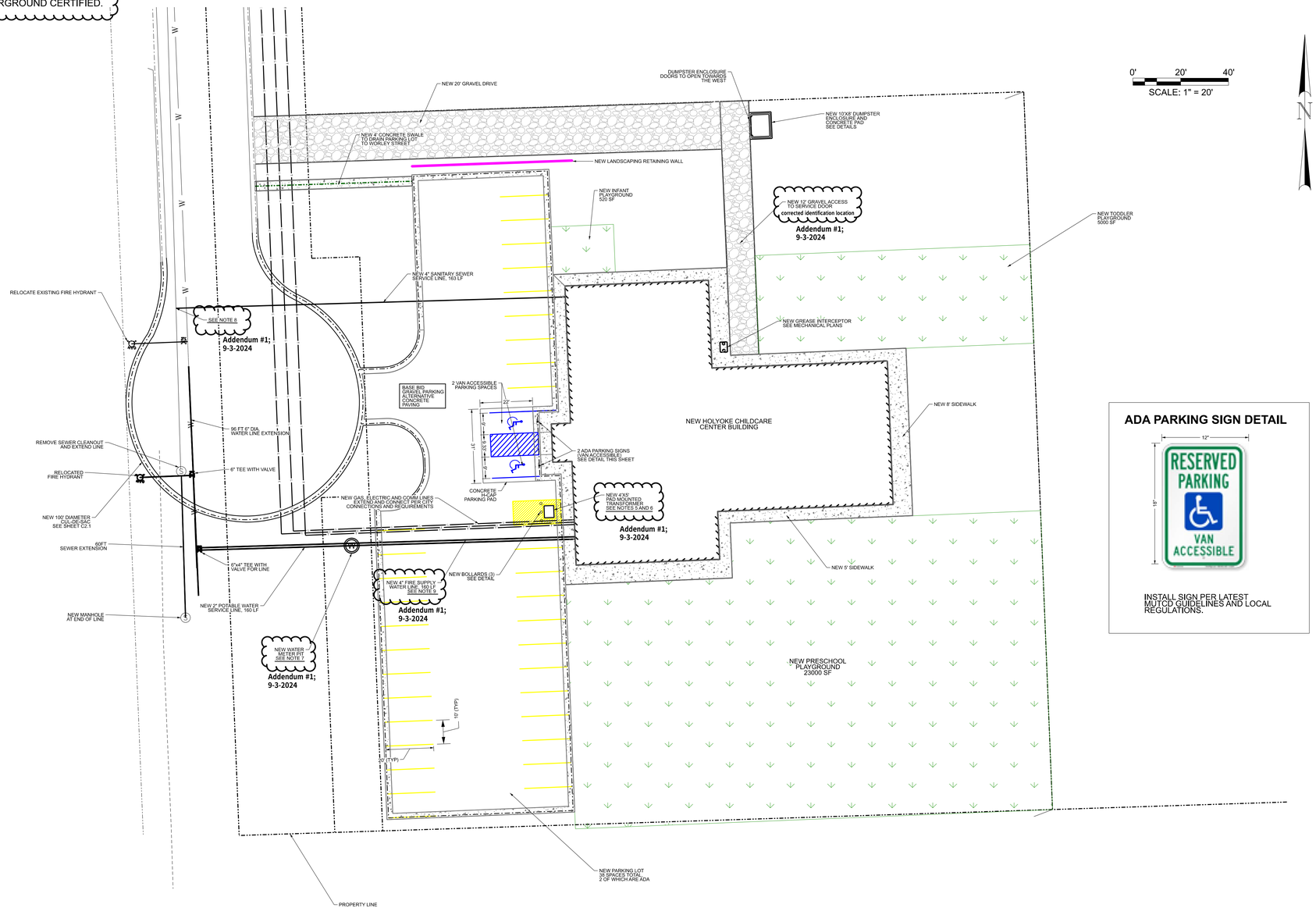
UTILITY NOTES:
1. INSTALL THRUST BLOCKS FOR NEW HYDRANT AND WATERLINE AS REQUIRED BY LOCAL REGULATIONS.
2. PROPOSED WATER AND SEWER LINE SERVICES MAY BE REDUCED IN SIZE PER MECHANICAL DESIGN FOR BUILDING.
3. UTILITIES BENEATH CUL-DE-SAC TO BE INSTALLED BEFORE THE INSTALLATION OF CUL-DE-SAC CONCRETE.
4. EXACT GAS LINE LOCATION TO BE DETERMINED BY GAS PROVIDER AND GENERAL CONTRACTOR.
5. ELECTRICAL LINE SHALL BE AT LEAST 30 INCHES BELOW GROUND.
6. CITY OF HOLYOKE WILL PROVIDE AND SET TRANSFORMER, METER, AND ELECTRICAL DISTRIBUTION LINES TO THE TRANSFORMER. ALL ELECTRICAL SERVICE FROM THE TRANSFORMER AND EXTERIOR LIGHTING ON THE PROPERTY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. THE CITY OF HOLYOKE WILL PROVIDE AND INSTALL THE TAP, LINE, METER, AND ALL FITTINGS BEFORE THE METER. LINES AFTER THE METER ARE THE RESPONSIBILITY OF THE CONTRACTOR INCLUDING MAKING THE CONNECTION TO THE OUTGOING SIDE OF THE METER. THE CITY OF HOLYOKE WILL PLACE THE METER AND METER PIT WITHIN THE RIGHT OF WAY.
8. THE CITY OF HOLYOKE WILL INSTALL THE 8" SEWER MAIN AND PROVIDE A 4" TAP FOR THE SEWER SERVICE. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE 4" SERVICE LINE FROM THE TAP AT THE 8" MAIN.
9. THE 4" DUCTILE IRON FIRE SERVICE LINE FROM THE TAP ON THE MAIN SHALL BE INSTALLED BY A CERTIFIED FIRE SUPRESSION INSTALLER, UNDERGROUND CERTIFIED.

Addendum #1;
9-3-2024

Addendum #1;
9-3-2024

AMENDED SHEET C 1.2 SITE PLAN



0' 20' 40'
SCALE: 1" = 20'

N

ADA PARKING SIGN DETAIL

INSTALL SIGN PER LATEST MUTCD GUIDELINES AND LOCAL REGULATIONS.

COLORADO REGISTERED
LOUIS B. HARMON
10586
9-3-2024
P.E. AND P.L.S.

Louis B. Harmon

DATE	DRAWING SET TITLE
AUG 2024	CONSTRUCTION PLANS
26 AUG 2024	UTILITY NOTES
03 SEPT 2024	UTILITY NOTES UPDATES

DRAWN BY: MXW
CHECKED BY: LH
JOB #: 22137

Y2 CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
LANDSCAPE ARCHITECTURE, GIS
NATURAL RESOURCE SERVICES
y2consultants.com
307 733 2999

HOLYOKE CHILDCARE

FIRST BAPTIST CHURCH ADDITION
SE¼ SECTION 17, T.7N., R.44W. OF 6TH P.M.
PHILLIPS COUNTY, COLORADO

SITE PLAN

C1.2

Bidder Bulletin 01

SPECIALIZED ENGINEERING SOLUTIONS
www.specializedeng.com

Date: 09/03/2024

Project Name: Holyoke Childcare Center **Project #:** 19146

The following manufacturers are approved to submit for the following:

1. Perfect Vision – Telecom, Div 27 Spec Sections
2. Telecor – Public Address, Spec Section 275116

Electrical General Items:

1. The preliminary PV Solar design developed by Owner vendor is being provided and shall be included in the project. Provide system as identified.
    A. Contact Owner Vendor for pricing and questions.
        1. Expert Electric, LLC
           PO Box 167
           Sterling, CO 80751
           Expertelectric@yahoo.com
           970-522-1781
        2. Refer to attached sheets: E-601, E-601.1, E-602, R-001, R-002

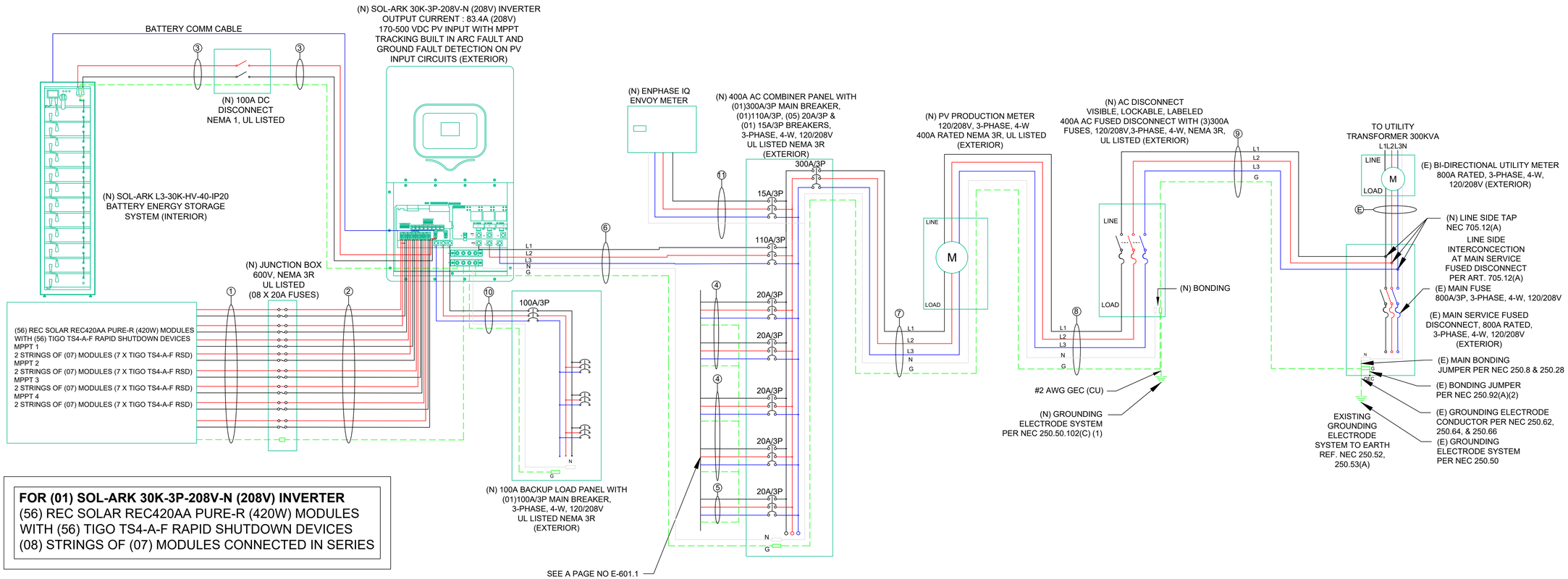
Submitted By: Jeremy Klima

jdr

DC SYSTEM SIZE: 50.40 KW DC
AC SYSTEM SIZE: 54.32 KW AC
ENERGY STORAGE SYSTEM 36.86 KWH ESS

ELECTRICAL- NEC 2020

FOR (01) SOL-ARK 30K-3P-208V-N (208V) INVERTER
(56) REC SOLAR REC420AA PURE-R (420W) MODULES
WITH (56) TIGO TS4-A-F RAPID SHUTDOWN DEVICES
(08) STRINGS OF (07) MODULES CONNECTED IN SERIES
FOR (64) ENPHASE IQ8H-3P-72-E-US (208V) MICROINVERTERS
WITH (64) REC SOLAR REC420AA PURE-R (420W) MODULES
(04) STRINGS OF (13) MODULES
(01) STRING OF (12) MODULES



FOR (01) SOL-ARK 30K-3P-208V-N (208V) INVERTER
(56) REC SOLAR REC420AA PURE-R (420W) MODULES
WITH (56) TIGO TS4-A-F RAPID SHUTDOWN DEVICES
(08) STRINGS OF (07) MODULES CONNECTED IN SERIES

Vmax = Voc + ((TLow - TStc) x (VocCoef x Voc/100))

Vmax = 59.4 + ((-20°C - 25°C) x (-0.24 x 59.4/100))

Vmax = 59.4 + (-45 x -0.143)

Vmax = 65.84

= 500 / 65.84

= 7.59 (MAXIMUM NUMBER OF MODULES IN SERIES)

ID	PARALLEL FEEDER	PHASE CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			NEUTRAL			GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			CONDUIT SIZE	CONDUIT TYPE
1	1	16	AWG #10	PV-WIRE/USE-2,CU		N/A		1	AWG #6	BARE,COPPER EGC	NA	FREE AIR
2	1	16	AWG #8	THWN-2,COPPER		N/A		1	AWG #10	THWN-2,COPPER EGC	1-1/2"	EMT
3	1	2	AWG #6	THWN-2,COPPER		N/A		1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
4	1	6	AWG #10	THWN-2,COPPER		N/A		1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
5	1	3	AWG #10	THWN-2,COPPER		N/A		1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
6	1	3	AWG #2	THWN-2,COPPER	1	AWG #2	THWN-2,COPPER	1	AWG #6	THWN-2,COPPER EGC	1-1/4"	EMT
7	1	3	MCM #300	THWN-2,COPPER	1	MCM #300	THWN-2,COPPER	1	AWG #4	THWN-2,COPPER EGC	2-1/2"	EMT
8	1	3	MCM #300	THWN-2,COPPER	1	MCM #300	THWN-2,COPPER	1	AWG #4	THWN-2,COPPER EGC	2-1/2"	EMT
9	1	3	MCM #300	THWN-2,COPPER		N/A		1	AWG #4	THWN-2,COPPER EGC	2-1/2"	EMT
10	1	3	AWG #2	THWN-2,COPPER	1	AWG #2	THWN-2,COPPER	1	AWG #8	THWN-2,COPPER EGC	1-1/4"	EMT
11	1	3	AWG #10	THWN-2,COPPER	1	AWG #10	THWN-2,COPPER		N/A		3/4"	EMT
E	EXISTING											

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GREENTECH RENEWABLES

CONTRACTOR

Expert Electric

EXPERT ELECTRIC, LLC
P.O. BOX 167/20151 K & H ST.
STERLING, CO 80751, USA
PHONE NO: (970) 522-1781
LICENSE NO: CO 7643

PROJECT NAME & ADDRESS

HOLYOKE DAYCARE
HOLYOKE, CO 80734, USA.

SIGNATURE WITH SEAL

REVISIONS

REV	DESCRIPTION	DATE
A.0	WIRE DIAGRAM	11/23/2023

SHEET TITLE

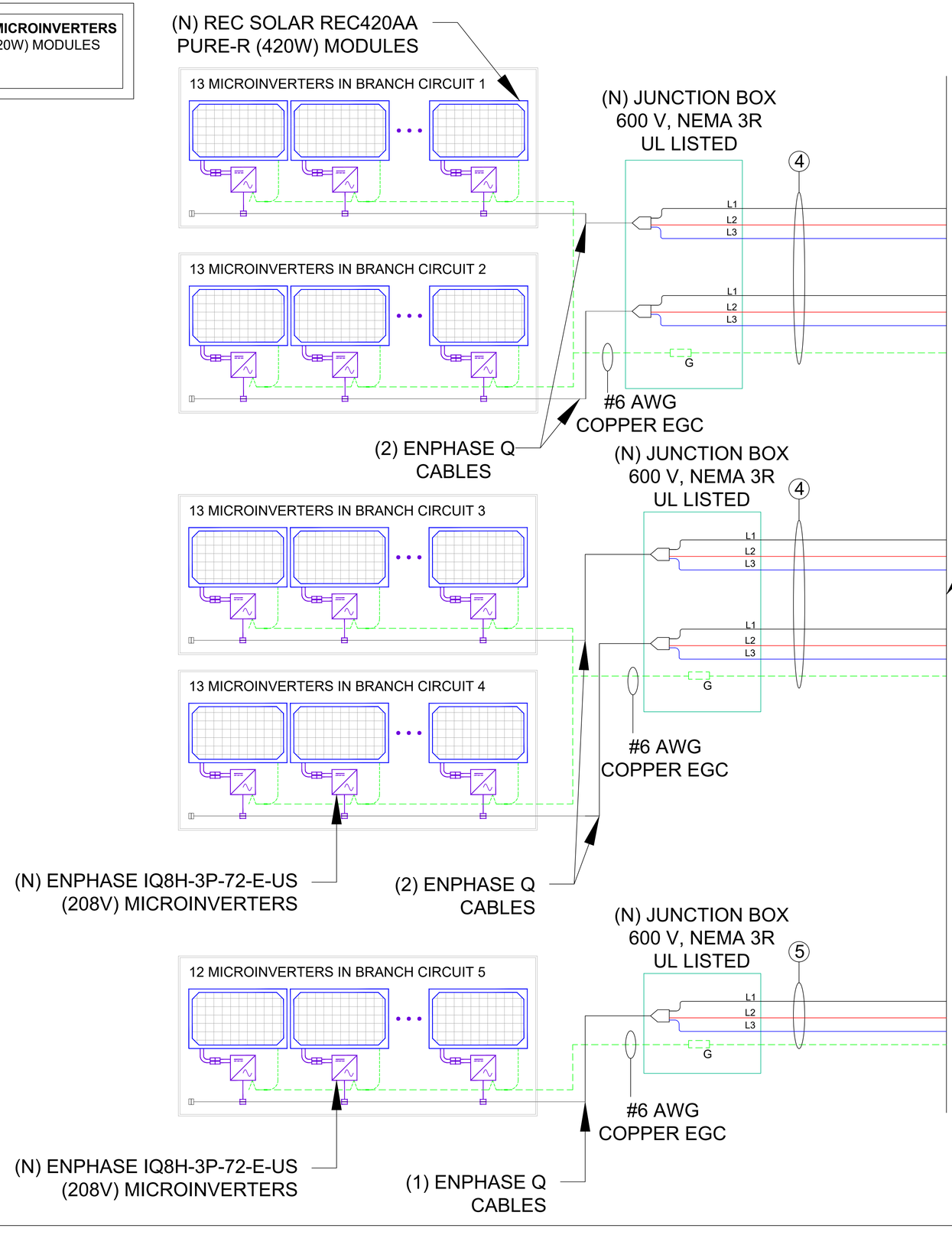
LINE DIAGRAM

DRAWN DATE	11-23-2023
DRAWN BY	GK
REVIEWED BY	JVK

SHEET NUMBER

E-601

FOR (64) ENPHASE IQ8H-3P-72-E-US (208V) MICROINVERTERS
WITH (64) REC SOLAR REC420AA PURE-R (420W) MODULES
(04) STRINGS OF (13) MODULES
(01) STRING OF (12) MODULES



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SHEET TITLE

LINE DIAGRAM

DRAWN DATE	11-23-2023
DRAWN BY	GK
REVIEWED BY	JVK

SHEET NUMBER

E-601.1

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	REC SOLAR REC420AA PURE-R MODULES (420W)
VMP	50.00 V
IMP	8.4 A
VOC	59.4 V
ISC	8.88 A
TEMP. COEFF. VOC	-0.24 %/°C
PTC RATING	402.5 W
MODULE DIMENSION	68.10 x 44 x 1.2 (IN INCHES)

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

INVERTER #1 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOL-ARK 30K-3P-208V-N (208V)
NOMINAL AC POWER	30000 W
NOMINAL OUTPUT VOLTAGE	208 VAC
NOMINAL OUTPUT CURRENT	83.4 A

INVERTER #2 SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ8H-3P-72-E-US (208V)
NOMINAL AC POWER	380 W
NOMINAL OUTPUT VOLTAGE	208 VAC
NOMINAL OUTPUT CURRENT	1.83 A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-20 °C
AMBIENT TEMP (HIGH TEMP 2%)	32 °C
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	32 °C
CONDUCTOR TEMPERATURE RATE	90 °C

MLPE: TIGO TS4-A-F RAPID SHUTDOWN DEVICES	
MAXIMUM INPUT VOLTAGE	80 VDC
MAXIMUM INPUT CURRENT	25 ADC

DC WIRE CALCULATION

WIRE ID	PARALLEL FEEDERS	EXPECTED WIRE TEMP (In Celsius)	TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL CORRECTION PER CEC 310.15(B)(3)(a)	CIRCUIT CONDUCTOR SIZE	CIRCUIT CONDUCTOR AMPACITY @75°(PER FEEDER SET)	CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B) 1.56 X Isc	DERATED AMPACITY OF CIRCUIT CONDUCTOR PER CEC TABLE 310.16 TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	DERATED AMPACITY OF CIRCUIT CONDUCTOR IS GREATER THAN REQUIRED	ESTIMATED DISTANCE (FT)	EXPECTED VOLTAGE DROP (%)
1	1	32°	0.96	16	1	#10 AWG	35A	40A	13.86A	38.4A	YES	60	0.40
2	1	32°	0.96	16	0.5	#8 AWG	50A	55A	13.86A	26.4A	YES	50	0.22
3	1	32°	0.96	2	1	#6 AWG	65A	75A	62.5A	72A	YES	20	0.25
											TOTAL DC VOLTAGE DROP (%) (FOR WIRE TAG 1 & 2)		0.62

AC WIRE CALCULATION

WIRE ID	PARALLEL FEEDERS	EXPECTED WIRE TEMP (In Celsius)	TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	CIRCUIT CONDUCTOR SIZE	CIRCUIT CONDUCTOR AMPACITY @75°(PER FEEDER SET)	CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B) 1.25 X Isc	DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16 TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	DERATED AMPACITY OF CIRCUIT CONDUCTOR IS GREATER THAN REQUIRED	ESTIMATED DISTANCE (FT)	EXPECTED VOLTAGE DROP (%)
4	1	32°	0.96	6	0.8	#10 AWG	35A	40A	17.17A	30.72A	YES	50	0.85
5	1	32°	0.96	3	1	#10 AWG	35A	40A	15.85A	30.72A	YES	50	0.78
6	1	32°	0.96	3	1	#2 AWG	115A	130A	104.25A	124.8A	YES	10	0.17
7	1	32°	0.96	3	1	#300 MCM	285A	320A	250.65A	307.2A	YES	10	0.11
8	1	32°	0.96	3	1	#300 MCM	285A	320A	250.65A	307.2A	YES	10	0.11
9	1	32°	0.96	3	1	#300 MCM	285A	320A	250.65A	307.2A	YES	10	0.11
10	1	32°	0.96	3	1	#2 AWG	115A	130A	100A	124.8A	YES	10	0.17
											TOTAL AC VOLTAGE DROP (%) (ADD TAG 4, 7, 8 & 9)		1.18

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LICENSE NO: CO 7643

PROJECT NAME & ADDRESS

HOLYOKE DAYCARE
HOLYOKE, CO 80734,
USA.

SIGNATURE WITH SEAL

REVISIONS	DESCRIPTION	DATE
REV	WIRE DIAGRAM	11/23/2023
A.0		

SHEET TITLE

ELECTRICAL CALCULATIONS

DRAWN DATE	11-23-2023
DRAWN BY	GK
REVIEWED BY	JVK

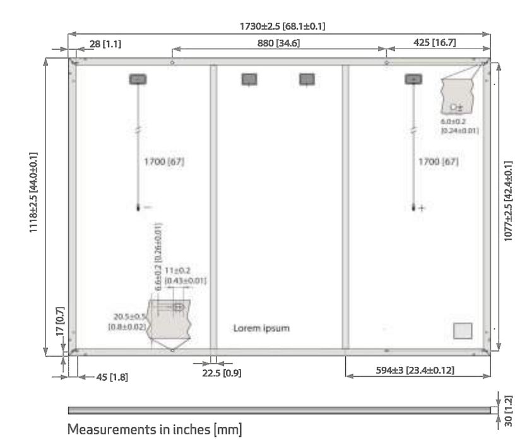
SHEET NUMBER

E-602

REC ALPHA PURE-R SERIES
PRODUCT SPECIFICATIONS

REC SOLAR'S MOST TRUSTED

GENERAL DATA	
Cell type:	80 half-cut REC bifacial, heterojunction cells with lead-free, gapless technology
Glass:	0.13 in (3.2 mm) solar glass with anti-reflective surface treatment in accordance with EN 12150
Backsheet:	Highly resistant polymer (black)
Frame:	Anodized aluminum (black)
Junction box:	4-part, 4 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790
Connectors:	Stäubli MC4 PV-KBT4/KST4 (12 AWG) in accordance with IEC 62852, IP68 only when connected
Cable:	12 AWG (4 mm²) PV wire, 67 + 67 in (1.7 + 1.7 m) in accordance with EN 50618
Dimensions:	68.1 x 44.0 x 1.2 in (20.77 ft²) / 1730 x 1118 x 30 mm (1.93 m²)
Weight:	47.4 lbs (21.5 kg)
Origin:	Made in Singapore



Measurements in inches [mm]

ELECTRICAL DATA		Product Code*: RECxxxAA PURE-R			
STC	Power Output - P_{MAX} (Wp)	400	410	420	430
STC	Watt Class Sorting - (W)	0/+10	0/+10	0/+10	0/+10
STC	Nominal Power Voltage - V_{MPP} (V)	48.8	49.4	50.0	50.5
STC	Nominal Power Current - I_{MPP} (A)	8.20	8.30	8.40	8.52
STC	Open Circuit Voltage - V_{OC} (V)	58.9	59.2	59.4	59.7
STC	Short Circuit Current - I_{SC} (A)	8.80	8.84	8.88	8.91
STC	Power Density (W/ft²)	19.26	19.74	20.22	20.70
STC	Panel Efficiency (%)	20.7	21.2	21.8	22.3
NMOT	Power Output - P_{MAX} (Wp)	305	312	320	327
NMOT	Nominal Power Voltage - V_{MPP} (V)	46.0	46.6	47.1	47.6
NMOT	Nominal Power Current - I_{MPP} (A)	6.64	6.70	6.80	6.88
NMOT	Open Circuit Voltage - V_{OC} (V)	55.5	55.8	56.0	56.3
NMOT	Short Circuit Current - I_{SC} (A)	7.11	7.16	7.20	7.24

Values at standard test conditions (STC: air mass AM 1.5, irradiance 10.75 W/sq ft (1000 W/m²), temperature 77°F (25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS	
IEC 61215:2016, IEC 61730:2016, UL 61730	
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
UL 61730	Fire Type 2
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (35mm)
IEC 62321	Lead-free acc. to RoHS EU 863/2015
ISO 14001, ISO 9001, IEC 45001, IEC 62941	

Intertek Lead-Free

TEMPERATURE RATINGS*	
Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P_{MAX}:	-0.24 %/°C
Temperature coefficient of V_{OC}:	-0.24 %/°C
Temperature coefficient of I_{SC}:	0.04 %/°C

*The temperature coefficients stated are linear values

MAXIMUM RATINGS	
Operational temperature:	-40 ... +85°C
System voltage:	1000 V
Test load (front):	+ 7000 Pa (146 lbs/ft²)*
Test load (rear):	- 4000 Pa (83.5 lbs/ft²)*
Series fuse rating:	25 A
Reverse current:	25 A

*See installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

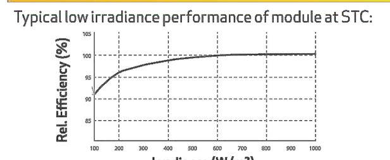
WARRANTY	Standard		REC ProTrust
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	All	≤25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

See warranty documents for details. Conditions apply

DELIVERY INFORMATION	
Panels per pallet:	33
Panels per 40 ft GP/high cube container:	858 (26 pallets)
Panels per 53 ft truck:	858 (26 pallets)

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Specifications subject to change without notice.

Ref: PD-DS-AAPR Rev 3.1 03.23

Available from:

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com
www.recgroup.com

Sol-Ark
30K-3P-208V-N
Spec Sheet

Solar	Input Power 39,000W
Max Allowed PV Power	39,000W
Max PV Power Delivered to Battery & AC Outputs	30,000W
Max DC Voltage (Voc)	500V @ 36A
MPPT Voltage Range	170-500V
Starting Voltage	150V
Number of MPPT	4
Max Solar Strings Per MPPT	2
Max DC Current per MPPT (Self Limiting)	36A
Max AC Coupled Input (Micro/String Inverters)	56,000W | 150A @120V x 3

AC Output Power 30kW On-Grid & Off-Grid	
Connections	208V Three Phase
Continuous AC Power to Grid (On-Grid)	30,000W 83.4A (208V)
Continuous AC Power to Load (Off-Grid)	30,000W 83.4A (208V) TBD
Surge AC Power 10sec	45,000VA 125A (208V)
Surge AC Power 100ms	TBD
Parallel Stacking	Yes—Up to 12
Frequency	60/50Hz
Continuous AC Power with Grid or Generator	72,000W 200A L-L (208V) 36,000W 200A L-N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption Typical—No Load	TBD
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	5ms
Power Factor	+/- 0.8 - 1.0

Battery (optional)	Output Power 30,000W
Type | Number of Inputs	Li-Ion | 2 Inputs
Nominal DC Input	> 300V
Capacity	50 — 9900Ah
Voltage Range	150V—550V
Continuous Battery Charging Output	100A (50A per Input)
Charging Curve	3-Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

General	
Dimensions (H x W x D)	35.2" x 20.8" x 11.6"
Weight	172 lbs
Enclosure	IP65 / NEMA 3R
Ambient Temperature	-40~60°C, >45°C Derating
Installation Style	Wall-Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty (verified by HALT Testing)	10 years

Protections & Certifications	
Electronics Certified Safety by SGS Labs to NEC & UL Specs - NEC 690.4B & NEC 705.4/6	Pending
Grid Sell Back — UL1741-2010/2018, IEEE1547a-2003/2014, FCC 15 Class B, UL1741SB, CA Rule 21, HECO Rule 14H	Pending
PV DC Disconnect Switch — NEC 240.15	Integrated
Ground Fault Detection — NEC 690.5	Integrated
PV Rapid Shutdown Control — NEC 690.12	Integrated
PV Arc Fault Detection — NEC 690.11	Integrated
PV Input Lightning Protection	Integrated
PV String Input Reverse Polarity Protection	Integrated
Surge Protection	DC Type II / AC Type II

Ref: PD-DS-AAPR Rev 3.1 03.23

Tigo

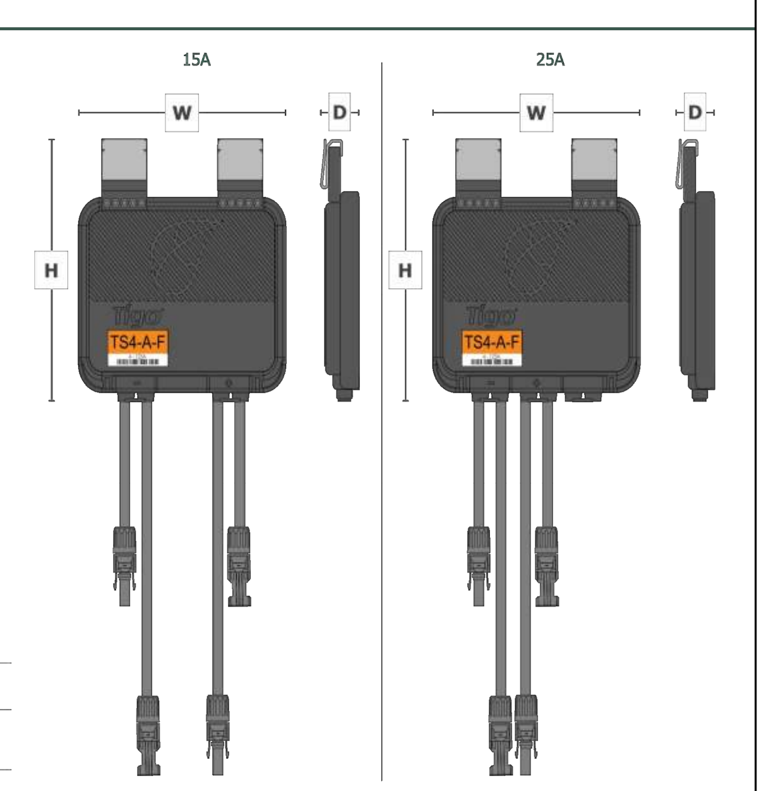
TS4-A-F
Module-level PV Rapid Shutdown

The TS4-A-F (Fire Safety) is the advanced add-on rapid shutdown solution that brings smart module functionality to standard PV modules for higher reliability. Ensure safety by upgrading existing PV systems or by adding safety features to new installations.

The TS4-A-F complies with NEC 2017, 2020 & 2023 690.12 Rapid Shutdown specifications when installed with the Tigo RSS Transmitter or an inverter with built-in Tigo certified transmitter.

Features

- High input current rating – Now rated for 20A Imp/ 25A Isc to better accommodate bifacial and high current modules
- Simple, Fast Installation – Snap to standard PV module frame or remove clips for rack mounting
- PLC Signaling – Rapid shutdown signaling over PV conductors
- Automatic Shutdown – PV array enters rapid shutdown mode in the event of AC grid loss
- PVRSS Certified – Tested and certified with hundreds of top inverter models
- 25-year warranty



Quick Specs

TS4-A-F	15A	25A
Height/width/depth	139.7 x 138.4 x 22.9mm (5.5 x 5.4 x 0.9in)	
Weight	490g (1.1lbs)	
Max Current (Imp/Isc)*	15A/NA	20A/25A
Max Power	700W	

*Use local codes/requirements to calculate maximum current.

Tigo

tigoenergy.com
PN: 002-00093-00 | Rev. 3.2 | 2023.06.26

Tigo

Electrical Data	15A	25A
Maximum input voltage	90V	80V
Operating voltage range	16 - 90V	16 - 80V
Maximum input current (Isc)	N/A	25A
Maximum input current (Imp)	15A	20A
Maximum wattage	700W	700W
Connections		
Module Conductor lengths	0.12m, 0.62m options available¹	0.62m options available¹
String Conductor lengths	1.2m, options available¹	
Connectors	MC4, EVO2, options available¹	

¹Contact sales for additional connector and conductor length options. MOQ may apply.

General Data		
Operating temperature range	**UL:** -30°C to +75°C (-22°F to +167°F) **IEC:** -40°C to +85°C (-40°F to +185°F)	**UL/IEC:** -40°C to +80°C (-40°F to +176°F)
Storage temperature range	-40°C to +85°C (-40°F to +185°F)	-40°C to +85°C (-40°F to +185°F)
Recommended fuse rating	20A	30A
Outdoor protection rating	IP68, NEMA 3R	IP68
Maximum altitude	2000m	3000m
Efficiency	99.6%	99.9%
Communication	PLC	
Rapid Shutdown Time Limit	30 secs or less²	
Conductor AWG Range	10-12 AWG	
PVRSE Controlled Conductors	≤30 Vdc, ≤240VA, ≤8A²	

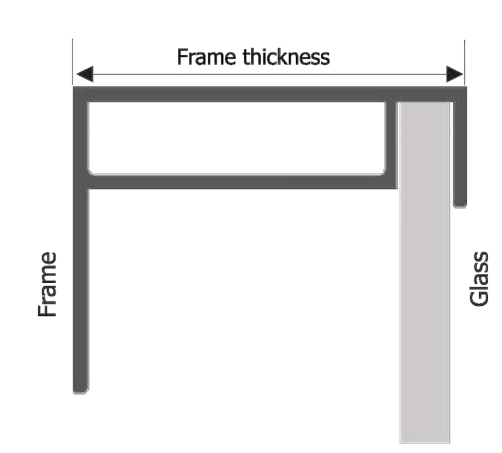
²Limits are based on NEC 690.12 rapid shutdown requirements.

Ordering Information	
459-00252-32	TS4-A-F, 15A, 700W, 1500V UL / 1000V IEC, 0.12/ 1.2m Cable, MC4
481-00252-02	TS4-A-F, 15A, 700W, 1500V UL / 1000V IEC, 0.62/1.2m Cable, MC4
481-00261-32	TS4-A-F, 15A, 700W, 1500V UL / IEC, 0.12/ 1.2m Cable, EVO2
481-00261-62	TS4-A-F, 15A, 700W, 1500V UL / IEC, 0.62/1.2m Cable, EVO2
486-00252-32	TS4-A-F, 25A, 700W, 1500V UL / 1000V IEC, 0.12/1.2m Cable, MC4
486-00252-62	TS4-A-F, 25A, 700W, 1500V UL / 1000V IEC, 0.62/1.2m Cable, MC4
486-00261-32	TS4-A-F, 25A, 700W, 1500V UL / IEC, 0.12/1.2m Cable, EVO2
486-00261-62	TS4-A-F, 25A, 700W, 1500V UL / IEC, 0.62/1.2m Cable, EVO2
488-00252-32	TS4-A-F, 25A, 700W, 1000V IEC, 0.12/1.2m Cable, MC4
488-00252-62	TS4-A-F, 25A, 700W, 1000V IEC, 0.62/1.2m Cable, MC4
488-00261-32	TS4-A-F, 25A, 700W, 1500V IEC, 0.12/1.2m Cable, EVO2
488-00261-62	TS4-A-F, 25A, 700W, 1500V IEC, 0.62/1.2m Cable, EVO2

Additional resources

Tigo TS4-A-F | Support | Tigo RSS | Community

Module Mounting



If frame thickness is ≤35mm (1.4in), install with the TS4 label facing the PV module.

Tigo

tigoenergy.com
PN: 002-00093-00 | Rev. 3.2 | 2023.06.26

Sol-Ark | L3 Series LimitLess Lithium™ Battery Energy Storage System

Technical Specifications: 208V Outdoor and Indoor

Battery Model:	L3 30K-HV-60-IP55	L3 30K-HV-40-IP20
System Data		
Compatible Inverter	Sol-Ark 30K-3P-208V-N	
Environmental Rating	Outdoor	Indoor
Cell Chemistry	Lithium Iron Phosphate	
Battery Cabinet Capacity	61.44kWh	40.96kWh
System Usable Energy¹	55.30kWh	36.86kWh
Inverter Grid/Gen/Load OCPD Rating	200A	
Backup Capability Per Inverter	30 kWac	
Max DC-Coupled Solar Per Inverter	39 kWac	
Max AC-Coupled Solar Per Inverter	54 kWac	
Max Battery Cabinets Per Inverter	6	
Min Battery Cabinets Per Inverter	1	
Inverter Stacks in Parallel	6²	8
Recommend Depth of Discharge	90%	
System Nominal Voltage	307V	410V
System Operating Voltage	249.6V–350.4V	332.8V–467.2V
Charge/Discharge Current³ • Recommend • Nominal/Continuous • Peak Discharge (2 mins, 25°C)	100A 100A 125A	50A
Combined Battery + Inverter Efficiency	90% (25C, 0.5C)	
Dimension (feet)	2.5W/3.5D/7.4H	1.9W/1.9D/5.3H
Weight	2095lbs	1384lbs
Operating Temperature⁴	-22°F to 131°F	-4°F to 131°F
Humidity	5%~85%RH	
Altitude	≤2000m	
Storage Temperature	-4°Fto 95°F	
Seismic Zone	4	
Communication Port	CAN2.0/RS485	
Battery Module Specifications		
Battery Modules in Series Per Cabinet	6s2p	8
Battery Module Energy	5.12kWh	
Battery Module Nominal Voltage	51.2V	
Battery Module Nominal Capacity	100Ah	
Battery Module Qty Per Cabinet		
Warranty and Certification		
Cycle Life	>6000 Cycles (77°F±7°F 0.5C/0.5C, EOL70%)	
Warranty⁵	10 Years	
Certification	UL9540, UL9540a, UN38.3, CEC, JA12, IEC62477, IEC62619, VDE-AR-N 4105, IEC62109, VDE2510-50	

1. DC usable energy, test conditions: 90% DOD, 0.3C charge and discharge at 25°C. System usable energy may vary due to system configuration parameters.
2. For larger outdoor installations, use the Sol-Ark Mega Ark.
3. The current is affected by temperature and SOC.
4. Charging disconnects below 32°F. Derating occurs above 113°F. Ambient temperature may exceed operating range on IP55 model if using included climate controls. See Sol-Ark technical sales for planning outdoor sites outside of operating temperature range.
5. Battery warranty expires at 6000 cycles or 10-year term, whichever occurs first. 5-year extended warranty option available for inverter only.

sol-ark.com | (972) 575-8875

GREENTECH RENEWABLES

CONTRACTOR

EXPERT ELECTRIC, LLC
P.O. BOX 167/20151 K & H ST.
STERLING, CO 80751, USA
PHONE NO: (970) 522-1781
LICENSE NO: CO 7643

PROJECT NAME & ADDRESS

HOLYOKE DAYCARE
HOLYOKE, CO 80734, USA.

SIGNATURE WITH SEAL

REVISIONS

REV	DESCRIPTION	DATE
A.0	WIRE DIAGRAM	11/23/2023

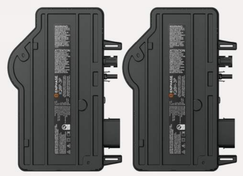
SHEET TITLE
RESOURCE DOCUMENT

DRAWN DATE	11-23-2023
DRAWN BY	GK
REVIEWED BY	JVK

SHEET NUMBER
R-001

ENPHASE

DATA SHEET



IQ8 Commercial Microinverters

The high-powered, smart grid-ready Enphase IQ8P-3P and IQ8H-3P Microinverters are specifically designed for 208 V three-phase interconnection for small commercial solutions.

Each microinverter integrates with the IQ Gateway Commercial 2 and the Enphase App monitoring and analysis software.

With simplified design, improved energy harvesting, and advanced monitoring, microinverters offer true peace of mind during operation and maintenance.

Enphase 25 year limited warranty

The IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.*

Easy to install

- Lightweight and compact with plug-and-play connectors
- Power line communication (PLC) between components
- Faster installation

High productivity and reliability

- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Smart Grid Ready

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547 (UL 1741-SB) requirements

* 25-year warranty is valid, provided an Internet-connected IQ Gateway is installed.

IQ8 Commercial Microinverters

INPUT DATA (DC)	UNITS	IQ8P-3P-72-E-US	IQ8H-3P-72-E-US
Commonly used modules for pairing[1]	W	380–640	320–540
Module compatibility[1]		54-cell/108 half-cell, 60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell	
Maximum input DC voltage	V	63	
Peak power tracking voltage	V	35.5–53	28.5–45
Operating range	V	16 - 63	
Min./Max. start voltage	V	21/63	
Max. DC continuous current (module I_{sc})	A	14	
Max. input DC short-circuit current	A	25	
Max DC short circuit current (module I_{sc})	A	20	
Overvoltage class DC ports		II	
DC port backfeed current	A	0	
PV array configuration		1 x 1 ungrounded array; no additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)		IQ8P-3P-72-E-US		IQ8H-3P-72-E-US	
Peak output power	VA	480		384	
Maximum continuous output power	VA	475		380	
Nominal (L-L) voltage/range[2]	V	208/183–229	220/198–242	208/183–229	220/198–242
Maximum continuous output current	A	2.28	2.16	1.83	1.73
Nominal frequency	Hz	60			
Extended frequency range	Hz	47–68			
Maximum microinverters per 20A 3 Phase branch circuit[3]		12	12	15	15
Overvoltage class AC port		III			
Power factor setting		1.0			
Power factor (adjustable)		0.85 leading ... 1.0 lagging			

EFFICIENCY		IQ8P-3P-72-E-US	IQ8H-3P-72-E-US
Peak efficiency	%	97.7	97.2
CEC weighted efficiency	%	97.5	97

MECHANICAL DATA	
Ambient temperature range	-40°C to +65°C (-40°F to +149°F)
Relative humidity range	4% to 100% (condensing)
DC connector type[4]	Enphase EN4 bulkhead; ECA-EN4-S22 ; EN4 (TE PV4-S SOLARLOK) 150 mm/5.9" to Staubli MC4 adapter cable pair (Default supply)[5]
Dimensions (H x W x D)	265 mm x 200 mm x 35 mm (10.4" x 7.8" x 1.4") without bracket
Weight	1.56 kg (3.4 lbs)
Cooling	Natural convection
Approved for wet locations	Yes
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category/UV exposure rating	IP67/sunlight resistant

FEATURES	
Communication	Power line communication (PLC)
Monitoring	Enphase App monitoring and analysis software. Both options require installation of an IQ Gateway Commercial 2.
Compliance	CA Rule 21 (UL 1741-SB), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01. This product is UL-Listed as PV rapid shutdown equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 rapid shutdown of PV systems for AC and DC conductors, when installed according to manufacturer's instructions.

(1) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at https://link.enphase.com/module-compatibility. (2) Nominal voltage range can be configured if required by the utility. (3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area. (4) Enphase IQ8P-3P and IQ8H-3P Microinverter bulkhead and adapter cable male, female DC connectors must only be mated with the identical type and manufacturer brand of male/female connector. (5) Qualified per UL subject 9703.

Data Sheet
Enphase Networking

Enphase IQ Commercial Envoy

The **Enphase IQ Commercial Envoy™** gateway delivers solar production and energy consumption data to Enphase Enlighten™ monitoring and analysis software for comprehensive, remote maintenance and management of three-phase Enphase IQ Systems.

With integrated production metering and optional consumption monitoring, the Envoy IQ is the platform for total energy management and integrates with the IQ Microinverters™ and Enphase IQ Battery™.

Smart

- Enables web-based monitoring and control
- Bidirectional communications for remote upgrades
- Supports power export limiting and zero-export applications

Simple

- Easy system configuration using Enphase Installer Toolkit™ mobile app
- Flexible networking with Wi-Fi, Ethernet, or cellular

Reliable

- Designed for installation indoors or outdoors in an enclosure
- Five-year warranty

UL LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase IQ Commercial Envoy

MODEL NUMBERS	
Enphase IQ Commercial Envoy™ ENV-IQ-AM3-3P	Three-phase communications gateway with integrated PV production metering (+/- 0.5%) and optional consumption monitoring (+/- 2.5%). Includes three 200A continuous rated production CTs.
ACCESSORIES (order separately)	
Enphase Mobile Connect™ - CELLMODEM-M1 (4G LTE Category M1) - CELLMODEM-M1-B (4G LTE Category M1)	Plug and play industrial grade cellular modem with five-year data plan (expandable to 12 years) for systems up to 60 microinverters (expandable). Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.
Consumption Monitoring CTs CT-200-SPLIT (order three or six, as needed)	Split-core current transformers enable consumption metering.
POWER REQUIREMENTS	
Power requirements	208Y/120 VAC three-phase 220Y/127 VAC three-phase Max 20 A overcurrent protection required
Typical Power Consumption	5W
CAPACITY	
Number of microinverters polled	Up to 300
MECHANICAL & ELECTRICAL DATA	
Dimensions (WxHxD)	21.3 x 12.6 x 4.5 cm (8.4" x 5" x 1.8")
Weight	17.6 oz (498 g)
Ambient temperature range	-40° to 65° C (-40° to 149° F) -40° to 46° C (-40° to 115° F) if installed in an enclosure
Environmental rating	IP30. For installation indoors or in an NRTL-certified, NEMA type 3R enclosure.
Altitude	To 2000 meters (6,560 feet)
Production CTs	- Are limited to 200A of continuous current / 250A OCPD – 72kW AC - Allow for parallel connected CTs for up to 500A – 144kW AC (if possible) - Internal aperture measures 19.36mm to support 250MCM THWN conductors (max) - Accuracy of +/-0.5% for production metering
Consumption CTs	- For electrical services to 250A with parallel runs up to 500A - Internal aperture measures 0.84" x 0.96" (21.33mm x 24.38mm) to support 3/0 THWN conductor - CT wire insulation rating of 600V - Accuracy of +/-2.5% for consumption monitoring
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	802.3, Cat5E (or Cat 6) UTP Ethernet cable, not included
Mobile	Optional, CELLMODEM-M1 (LTE), CELLMODEM-01 (3G), or CELLMODEM-03 (4G), not included
COMPLIANCE	
Compliance	UL 916 CAN/CSA C22.2 No. 61010-1 47 CFR, Part 15, Class B, ICES 003 IEC/EN 61010-1:2010, EN50065-1, EN61000-4-5, EN61000-6-1, EN61000-6-2

To learn more about Enphase offerings, visit **enphase.com**

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GREENTECH RENEWABLES

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CONTRACTOR

Expert Electric

EXPERT ELECTRIC, LLC
P.O. BOX 167/20151 K & H ST.
STERLING, CO 80751, USA
PHONE NO: (970) 522-1781
LICENSE NO: CO 7643

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HOLYOKE DAYCARE
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USA.

SIGNATURE WITH SEAL

REVISIONS

REV	DESCRIPTION	DATE
A.0	WIRE DIAGRAM	11/23/2023

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RESOURCE DOCUMENT

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REVIEWED BY	JVK

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