



DOCKET ITEM #4
Special Use Permit # 2022-00103
4513 Duke Street – DHL Express Temporary Trailer

Application	General Data	
Public hearing and consideration of a request for a special use permit to amend Condition #3 for the extension of a temporary trailer use (amending SUP #2020-00105).	Planning Commission Hearing:	February 7, 2023
	City Council Hearing:	February 25, 2023
Address: 4513 Duke Street	Zone:	CG/Commercial General
Applicant: DHL Express	Small Area Plan:	Seminary Hill/Strawberry Hill

Staff Recommendation: APPROVAL subject to compliance with all applicable codes and ordinances and the recommended permit conditions found in Section III of this report.

Staff Reviewer: Patrick Silva, patrick.silva@alexandriava.gov

PROJECT LOCATION MAP



I. DISCUSSION

The applicant DHL Express requests Special Use Permit approval to extend the use term of a temporary trailer beyond March 12, 2023, amending Condition #3. The temporary trailer is located in the parking lot at Foxchase Shopping Center located at 4513 Duke Street.

SITE DESCRIPTION

The Foxchase Shopping Center, known as the Shoppes of Foxchase, are located on a 444,807 square foot lot at the corner of Duke Street and North Jordan Street. The lot is developed with a 583-space surface parking lot. The 151,000 gross square foot shopping center contains several retail, restaurant and personal service uses (Figure 1).

The Foxchase Apartments are located to the east and the north. An Aldi grocery store, Valvoline Oil Change and the 4600 Duke Street Condominiums are sited across Duke Street to the south. The Holmes Run Trail and the Duke Street Dog Park are located immediately to the west.



Figure 1: Trailer Location at the Shoppes of Foxchase

BACKGROUND

City Council approved Development Special Use Permit #2004-00025 for the construction of the shopping center and the parking lot. Pursuant to the City's Continuity of Government Ordinance related to the COVID-19 emergency, on December 8, 2020, City Council ratified the use of temporary trailers for package delivery businesses on private property in commercial zones, temporarily waiving the need for Special Use Permit approval until March 31, 2021. The City Council realized the community benefits of allowing package shipping and delivery services, in time for the winter holiday season, at outdoor locations which easily accommodate social distancing. DHL Express availed itself of the opportunity and installed a temporary trailer on the southwest corner of the shopping center parking lot. As the location proved popular, DHL Express

requested to maintain the temporary trailer past March 31, 2021 and, subsequently, submitted a Special Use Permit application (SUP2020-00105) requesting a two-year use of the temporary trailer which City Council approved on March 12, 2021. With the temporary trailer approval granted by Special Use Permit #2020-00105 nearing its March 12, 2023 expiration date, the applicant found the trailer's presence at the subject site still proved to be quite popular and wished to extend its ability to remain in its current location via approval of a Special Use Permit amendment. Thus, the applicant has submitted the Special Use Permit request which is the subject of this report.

PROPOSAL

The applicant requests Special Use Permit approval for a temporary trailer at 4513 Duke Street. The 140 square-foot trailer would remain at its existing site on three parking spaces at the southwest corner of the shopping center (Figures 2-3). One passenger van picks-up and delivers packages once a day and parks momentarily in an adjacent parking space. Express employees accommodate approximately 15 customers a day between 9 a.m. and 6 p.m., Monday through Friday, and between 11:00 a.m. and 6:00 p.m., Saturday.

Consistent with staff's standard approach for temporary trailer approval duration, the applicant proposes to operate the trailer for two more years, with an additional three years available with staff approval of an Administrative Special Use Permit. Up to two DHL employees would be present during the hours the trailer is in operation.



Figure 2: Temporary trailer viewed from shopping center.



Figure 3: Temporary trailer viewed from Duke Street

PARKING

Section 8-200(A)(16)(a)(i) requires retail uses to provide a minimum of 0.25 spaces for every 1,000 square feet of area in the enhanced transit area. With 187 square feet of space the package shipping retail use would require one parking space. Given that parking requirements of two or less are waived according to Section 8-100(A)(9), the temporary trailer and the use do not have a parking requirement. Although the temporary trailer occupies three spaces in the 583-space shared parking lot, it would not infringe on other uses' parking requirements as the retail, restaurant and personal service uses at the shopping center collectively require no greater than 151 spaces based on the current standards of Section 8-200.

ZONING/MASTER PLAN DESIGNATION

Section 7-1101(C) of the Zoning Ordinance allows temporary trailers for nonresidential purposes with City Council approval of an Special Use Permit. Package shipping businesses are defined as retail uses. Pursuant to Section 4-402(K), retail uses up to 20,000 gross square feet are permitted in the CG zone.

The Seminary Hill/Strawberry Hill Small Area Plan designates the lot for commercial use.

II. STAFF ANALYSIS

Staff recommends approval to extend the term of use for DHL Express's temporary trailer at 4513 Duke Street. The location has proven to be a successful package shipping destination as the company reported it represents one of the highest performing DHL Express pop-ups in the United States. The corner parking lot site has operated without parking or traffic flow impacts since it opened in December 2020. Pedestrians are provided with an area safe from parking lot traffic to carry out transactions at the service window. Staff has included Condition #2 to ensure that the temporary trailer remains at this location within the shopping center parking lot during the time that the Special Use Permit is active and the trailer is in operation. The standard time limit for temporary trailers recently approved through Special Use Permit is two years, with an additional three years available with staff approval of an Administrative Special Use Permit. Condition #3 states, therefore, that the Special Use Permit expires on February 25, 2025, with an opportunity to increase the term for an additional three years through an Administrative Special Use Permit.

Subject to the conditions contained in Section III of this report, staff recommends approval of the Special Use Permit request.

III. RECOMMENDED CONDITIONS

Staff recommends **approval** subject to compliance with all applicable codes and ordinances and the following conditions:

1. The Special Use Permit shall be granted to the applicant only or to any business or entity in which the applicant has a controlling interest. (P&Z) (SUP2020-00105)
2. **CONDITION AMENDED BY STAFF:** The location and specifications of the temporary trailer shall be substantially consistent as proposed in the application dated ~~December 4~~November 22, 2022. (P&Z) (~~SUP2020-00105~~)
3. **CONDITION AMENDED BY STAFF:** The temporary trailer shall be permitted at the site for a two-year term which expires on ~~March 12~~February 25, 2025, with an opportunity to increase the term for an additional three years through an Administrative Special Use Permit. (P&Z) (~~SUP2020-00105~~)
4. The applicant shall conduct employee training sessions on an ongoing basis, including as part of any employee orientation, to discuss all SUP provisions and requirements. (P&Z) (SUP2020-00105)
5. Litter on the site and on public rights-of-way and spaces adjacent to or within 75 feet of the premises shall be picked up at least twice a day and at the close of business, and more often if necessary, to prevent an unsightly or unsanitary accumulation, on each day that the business is open to the public. (P&Z) (SUP2020-00105)
6. **CONDITION DELETED BY STAFF:** ~~This use shall comply with the City noise ordinance.~~ (P&Z) (~~SUP2020-00105~~)
7. **CONDITION AMENDED BY STAFF:** The Director of Planning and Zoning shall review the Special Use Permit one year after it has been operational and shall docket the matter for consideration by the Planning Commission and City Council if (a) there have been documented violations of the permit conditions which were not corrected immediately, constitute repeat violations or which create a direct and immediate adverse zoning impact on the surrounding community; (b) the Director has received a request from any person to docket the permit for review as a result of a complaint that rises to the level of a violation; or (c) the Director has determined that there are problems with the operation of the use and that new or revised conditions are needed. (P&Z) (~~SUP2020-00105~~)
8. **CONDITION ADDED BY STAFF:** The applicant shall require its employees who drive to use off-street parking. (T&ES)
9. **CONDITION ADDED BY STAFF:** The applicant shall encourage its employees to use public transportation to travel to and from work. The business shall contact Go Alex at goalex@alexandriava.gov for information on establishing an employee transportation

benefits program. (T&ES)

10. **CONDITION ADDED BY STAFF:** The applicant shall provide information about alternative forms of transportation to access the site, including but not limited to printed and electronic business promotional material, posting on the business website, and other similar methods. Contact Go Alex at goalex@alexandriava.gov for more information about available resources. (T&ES)
11. **CONDITION ADDED BY STAFF:** The applicant shall encourage patrons to park off-street through the provision of information about nearby garages or lots in the business' advertising and website. (T&ES)

STAFF: Patrick Silva, Urban Planner
Ann Horowitz, Principal Planner
Tony LaColla, Division Chief, Land Use Services

Staff Note: In accordance with Section 11-506(c) of the Zoning Ordinance, construction or operation shall be commenced and diligently and substantially pursued within 18 months of the date of granting of a Special Use Permit by City Council or the Special Use Permit shall become void.

IV. CITY DEPARTMENT COMMENTS

Legend: C - code requirement R - recommendation S - suggestion F - finding

Transportation & Environmental Services:

- R-1 The applicant shall require its employees who drive to use off-street parking. (T&ES)
- R-2 The applicant shall encourage its employees to use public transportation to travel to and from work. The business shall contact Go Alex at goalex@alexandriava.gov for information on establishing an employee transportation benefits program. (T&ES)
- R-3 The applicant shall provide information about alternative forms of transportation to access the site, including but not limited to printed and electronic business promotional material, posting on the business website, and other similar methods. Contact Go Alex at goalex@alexandriava.gov for more information about available resources. (T&ES)
- R-4 The applicant shall encourage patrons to park off-street through the provision of information about nearby garages or lots in the business' advertising and website. (T&ES)

Code:

No comments or concerns.

Fire:

No comments or concerns.

Parks and Recreation:

No comments or concerns.

Police Department:

No comments received.

Archaeology:

No comments or concerns.



APPLICATION SPECIAL USE PERMIT

SPECIAL USE PERMIT # _____

PROPERTY LOCATION: 4513 Duke St, Alexandria, VA, 22304

TAX MAP REFERENCE: 049.03-06-04

ZONE: CG

APPLICANT:

Name: DHL Express US

Address: 4513 Duke St. Alexandria, VA

PROPOSED USE: Temporary Trailer - to continue providing domestic and international shipping services

- ☒ THE UNDERSIGNED, hereby applies for a Special Use Permit in accordance with the provisions of Article XI, Section 4-11-500 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.
- ☒ THE UNDERSIGNED, having obtained permission from the property owner, hereby grants permission to the City of Alexandria staff and Commission Members to visit, inspect, and photograph the building premises, land etc., connected with the application.
- ☒ THE UNDERSIGNED, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notice on the property for which this application is requested, pursuant to Article IV, Section 4-1404(D)(7) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.
- ☒ THE UNDERSIGNED, hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Director of Planning and Zoning on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

Essete G Abebe

Print Name of Applicant or Agent

1210 S Pine Island Drive,

Mailing/Street Address

Plantation, FL

City and State

33324

Zip Code

Signature

11/22/22

Date

4803810603

Telephone #

Fax #

essete.gebriel@dhl.com

Email address

PROPERTY OWNER'S AUTHORIZATION

As the property owner of Shoppes at Foxchase, I hereby
(Property Address)
grant the applicant authorization to apply for the provide domestic and shipping services to the public use as
(use)
described in this application.

Name: GRI Foxchase LLC, by First Washington Realty, Inc, its authorized agent by

Phone 301-907-7800

Please Print

Address: 7200 Wisconsin Ave Ste, C/O First Washington Realty, Inc, Bethesda, MD 20814

Email: bdonovan@firstwash.com

Signature: Kenneth E. Miller

Date: 11/22/2022

1. Floor Plan and Plot Plan. As a part of this application, the applicant is required to submit a floor plan and plot or site plan with the parking layout of the proposed use. The SUP application checklist lists the requirements of the floor and site plans. The Planning Director may waive requirements for plan submission upon receipt of a written request which adequately justifies a waiver.

☒ Required floor plan and plot/site plan attached.

☐ Requesting a waiver. See attached written request.

2. The applicant is the (check one):

☐ Owner

☐ Contract Purchaser

☐ Lessee or

☐ Other: _____ of the subject property.

State the name, address and percent of ownership of any person or entity owning an interest in the applicant or owner, unless the entity is a corporation or partnership, in which case identify each owner of more than three percent.
Deutsche Post AG - 100% of ownership - DHL Express US

OWNERSHIP AND DISCLOSURE STATEMENT

Use additional sheets if necessary

1. Applicant. State the name, address and percent of ownership of any person or entity owning an interest in the applicant, unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1 Deutsche Post AG	Platz der Deutsche Post,	100%
2.	53113, Bonn Germany	
3.		

2. Property. State the name, address and percent of ownership of any person or entity owning an interest in the property located at 4513 Duke St. Alexandria, VA (address), unless the entity is a corporation or partnership, in which case identify each owner of more than three percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1 GRI Foxchase LLC	7200 Wosconsin Ave Ste 600	100%
2.	Bethesda, MD 20814-4830	
3.	7200 Wosconsin Ave Ste, C/O First Washington Realty, Inc. Bethesda, MD 20814	

3. Business or Financial Relationships. Each person or entity indicated above in sections 1 and 2, with an ownership interest in the applicant or in the subject property are require to disclose **any** business or financial relationship, as defined by Section 11-350 of the Zoning Ordinance, existing at the time of this application, or within the 12-month period prior to the submission of this application with any member of the Alexandria City Council, Planning Commission, Board of Zoning Appeals or either Boards of Architectural Review. **All fields must be filled out completely. Do not leave blank. (If there are no relationships please indicated each person or entity and "None" in the corresponding fields).**

For a list of current council, commission and board members, as well as the definition of business and financial relationship, [click here](#).

Name of person or entity	Relationship as defined by Section 11-350 of the Zoning Ordinance	Member of the Approving Body (i.e. City Council, Planning Commission, etc.)
1 Deutsche Post AG	none	NA
2 GRI FoxChase LLC	none	NA
3.		

NOTE: Business or financial relationships of the type described in Sec. 11-350 that arise after the filing of this application and before each public hearing must be disclosed prior to the public hearings.

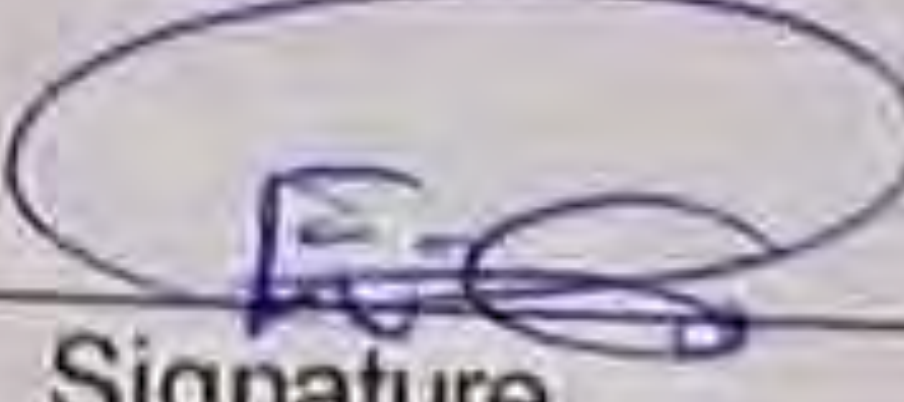
As the applicant or the applicant's authorized agent, I hereby attest to the best of my ability that the information provided above is true and correct.

11/22/22

Date

Essefe G Abebe

Printed Name



Signature

If property owner or applicant is being represented by an authorized agent such as an attorney, realtor, or other person for which there is some form of compensation, does this agent or the business in which the agent is employed have a business license to operate in the City of Alexandria, Virginia?

☐ **Yes.** Provide proof of current City business license

☐ **No.** The agent shall obtain a business license prior to filing application, if required by the City Code.

NARRATIVE DESCRIPTION

3. The applicant shall describe below the nature of the request **in detail** so that the Planning Commission and City Council can understand the nature of the operation and the use. The description should fully discuss the nature of the activity. (Attach additional sheets if necessary.)

We want to request to have your approval to extend our permit for two years. We have been a proud member of the Alexandria, VA community for many years, and we introduced the DHL Popup concept in

2020. Because of the presence of the Popup in Alexandria, we were able to support the local

citizens shipping to over 120 countries and is adjacent to Census Tract 2003.03 and within 2 miles of 2

other opportunity zones with the City of Alexandria. Over 4000 customers used this for shipping

services since opening and the feedback has been that the popup model is the preferred model due to the convenience of the window service and proximity of parking.

The Mobile Popup ServicePoint is a 187 square feet full-service shipping store build on a hydraulic lift

platform and accomodate all essential amenities, such as HVAC, security and computer systems

including a fast, efficient Point-of-Sale system that can process shipment for destinations around the US

& the world. The DHL Popup Servicepoint promotes sustainability, safety, and convenience. We have

found these popup stores to be beneficial for the City of Alexandria community and we ask for your

approval to extend our permit to continue serving the community.

Attached is the site plan for the DHL Popup. The popup or site will be used to process domestic and international

packages. We thank you for your support and look forward to continuing to grow and evolve with the City of

Alexandria.

USE CHARACTERISTICS

4. The proposed special use permit request is for (*check one*):
☐ a new use requiring a special use permit,
☐ an expansion or change to an existing use without a special use permit,
☒ an expansion or change to an existing use with a special use permit,
☐ other. Please describe: _____
5. Please describe the capacity of the proposed use:
- A. How many patrons, clients, pupils and other such users do you expect?
Specify time period (i.e., day, hour, or shift).
10-15 customers / day
- B. How many employees, staff and other personnel do you expect?
Specify time period (i.e., day, hour, or shift).
2 employees / day
6. Please describe the proposed hours and days of operation of the proposed use:
- | Day: | Hours: |
|------------------------|----------------------------|
| <u>Monday - Friday</u> | <u>09:00 am - 06:00 pm</u> |
| <u>Saturday</u> | <u>11:00 am - 06:00 pm</u> |
| _____ | _____ |
| _____ | _____ |
7. Please describe any potential noise emanating from the proposed use.
- A. Describe the noise levels anticipated from all mechanical equipment and patrons.
no noise
- B. How will the noise be controlled?

8. Describe any potential odors emanating from the proposed use and plans to control them:
no odors

9. Please provide information regarding trash and litter generated by the use.

A. What type of trash and garbage will be generated by the use? (i.e. office paper, food wrappers)
papers, shipping lables and bubble wrap

B. How much trash and garbage will be generated by the use? (i.e. # of bags or pounds per day or per week)
one trash bag / day

C. How often will trash be collected?
daily

D. How will you prevent littering on the property, streets and nearby properties?
We clean up the popup daily and check the surrounding area

10. Will any hazardous materials, as defined by the state or federal government, be handled, stored, or generated on the property?

☐ Yes. ☒ No.

If yes, provide the name, monthly quantity, and specific disposal method below:

11. Will any organic compounds, for example paint, ink, lacquer thinner, or cleaning or degreasing solvent, be handled, stored, or generated on the property?

☒ Yes. ☐ No.

If yes, provide the name, monthly quantity, and specific disposal method below:

We use & maintain one extra ink cartridge for both an inkjet and laser printer.

We typically dispose of 3 inkjet cartridges in a 6 month period. We use one

colorx wipes, window and floor cleaner to maintain the cleanliness of the servicepoint.

12. What methods are proposed to ensure the safety of nearby residents, employees and patrons?

We have 24 hour security system to monitor activities outside and inside of the popup which includes Cameras, remote monitoring, glass break alarm and panic button. Safety equipment is on hand including a first aid kit, fire extinguisher and non-slip floor mats. We have three safety poles 8 feet in front of the servicepoint with reflectors to alert any other cars in the parking lot that the area is secure area.

ALCOHOL SALES

13. A. Will the proposed use include the sale of beer, wine, or mixed drinks?

☐ Yes ☒ No

If yes, describe existing (if applicable) and proposed alcohol sales below, including if the ABC license will include on-premises and/or off-premises sales.

PARKING AND ACCESS REQUIREMENTS

14. A. How many parking spaces of each type are provided for the proposed use:

3
_____ Standard spaces
_____ Compact spaces
_____ Handicapped accessible spaces.
_____ Other.

Planning and Zoning Staff Only
Required number of spaces for use per Zoning Ordinance Section 8-200A _____
Does the application meet the requirement? <input type="checkbox"/> Yes <input type="checkbox"/> No

- B. Where is required parking located? (check one)
☒ on-site
☐ off-site

If the required parking will be located off-site, where will it be located?

PLEASE NOTE: Pursuant to Section 8-200 (C) of the Zoning Ordinance, commercial and industrial uses may provide off-site parking within 500 feet of the proposed use, provided that the off-site parking is located on land zoned for commercial or industrial uses. All other uses must provide parking on-site, except that off-street parking may be provided within 300 feet of the use with a special use permit.

- C. If a reduction in the required parking is requested, pursuant to Section 8-100 (A) (4) or (5) of the Zoning Ordinance, complete the PARKING REDUCTION SUPPLEMENTAL APPLICATION.

☐ Parking reduction requested; see attached supplemental form

15. Please provide information regarding loading and unloading facilities for the use:

- A. How many loading spaces are available for the use? na

Planning and Zoning Staff Only
Required number of loading spaces for use per Zoning Ordinance Section 8-200 _____
Does the application meet the requirement? <input type="checkbox"/> Yes <input type="checkbox"/> No

B. Where are off-street loading facilities located? na

C. During what hours of the day do you expect loading/unloading operations to occur?
na

D. How frequently are loading/unloading operations expected to occur, per day or per week, as appropriate?
na

16. Is street access to the subject property adequate or are any street improvements, such as a new turning lane, necessary to minimize impacts on traffic flow?

The street access to the subject property is adequate.

SITE CHARACTERISTICS

17. Will the proposed uses be located in an existing building? ☐ Yes ☒ No

Do you propose to construct an addition to the building? ☐ Yes ☒ No

How large will the addition be? NA square feet.

18. What will the total area occupied by the proposed use be?

187 sq. ft. (existing) + _____ sq. ft. (addition if any) = _____ sq. ft. (total)

19. The proposed use is located in: (check one)

☐ a stand alone building

☐ a house located in a residential zone

☐ a warehouse

☐ a shopping center. Please provide name of the center: Shoppes at Foxchase

☐ an office building. Please provide name of the building: _____

☐ other. Please describe: _____

End of Application



Department of Planning & Zoning Special Use Permit Application Checklist

Supplemental application for the following uses:

- ☐ Automobile Oriented
- ☐ Parking Reduction
- ☐ Signs
- ☐ Substandard Lot
- ☐ Lot modifications requested with SUP use

Interior Floor Plan

- ☐ Include labels to indicate the use of the space (doors, windows, seats, tables, counters, equipment)

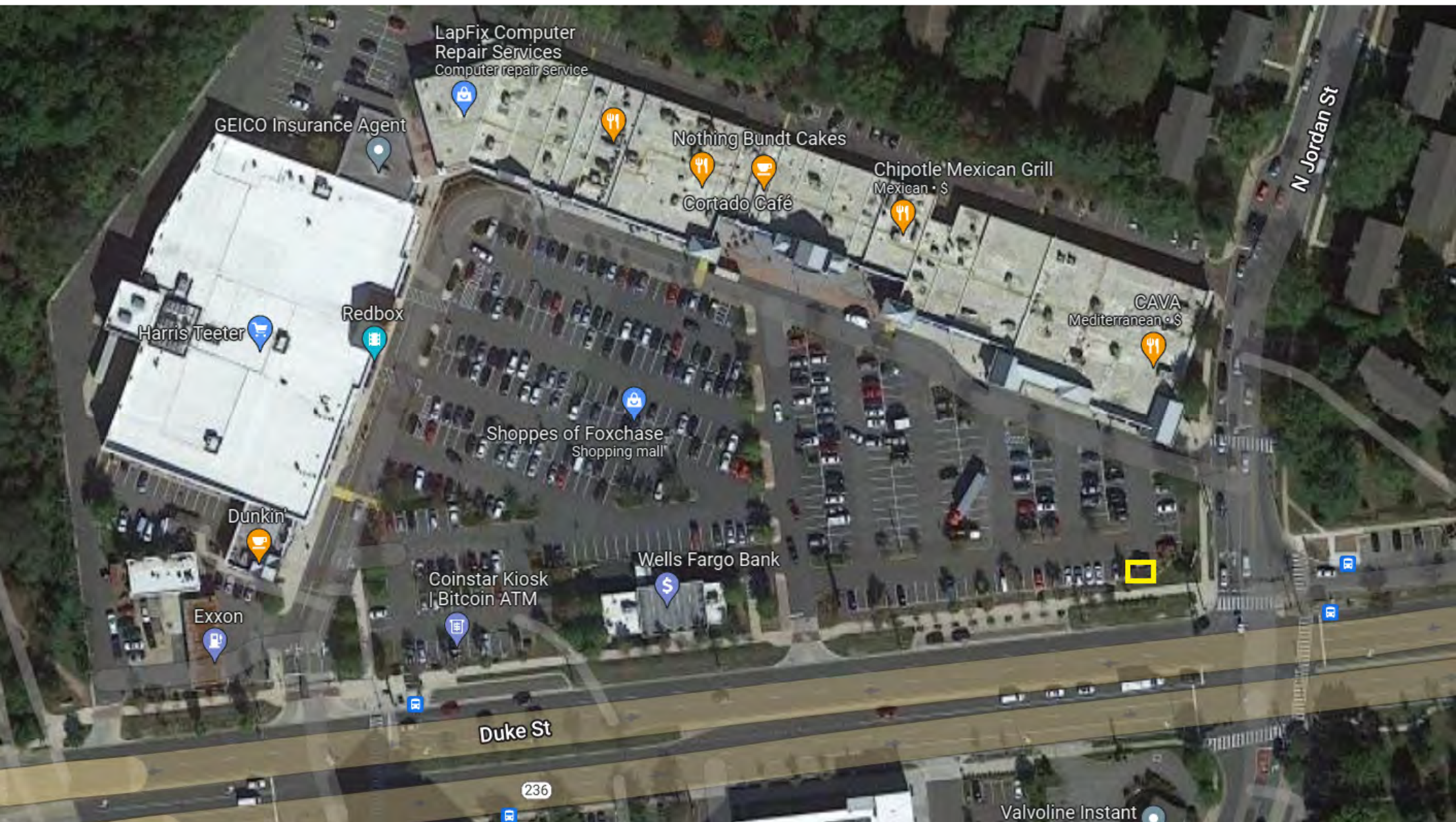
If Applicable

- ☒ Plan for outdoor uses

Contextual site image

- ☒ Show subject site, on-site parking area, surrounding buildings, cross streets





Overview



Location:

Pop ups are positioned in well-lit shopping centers, in non-congested areas



Structure:

Steel-framed structure built on a hydraulic steel commercial trailer with ability to lower almost flush to the ground, 1" duo tempered glass with aluminum framing; stamped drawings provided



Floor Plan:

Floor plan of the trailers is approximately 140 square feet and has an interior usable space of 97 square feet



Power:

Off grid model uses solar/rechargeable batteries to power electronic equipment for business use and energy efficient mini-split HVAC.



Accessibility:

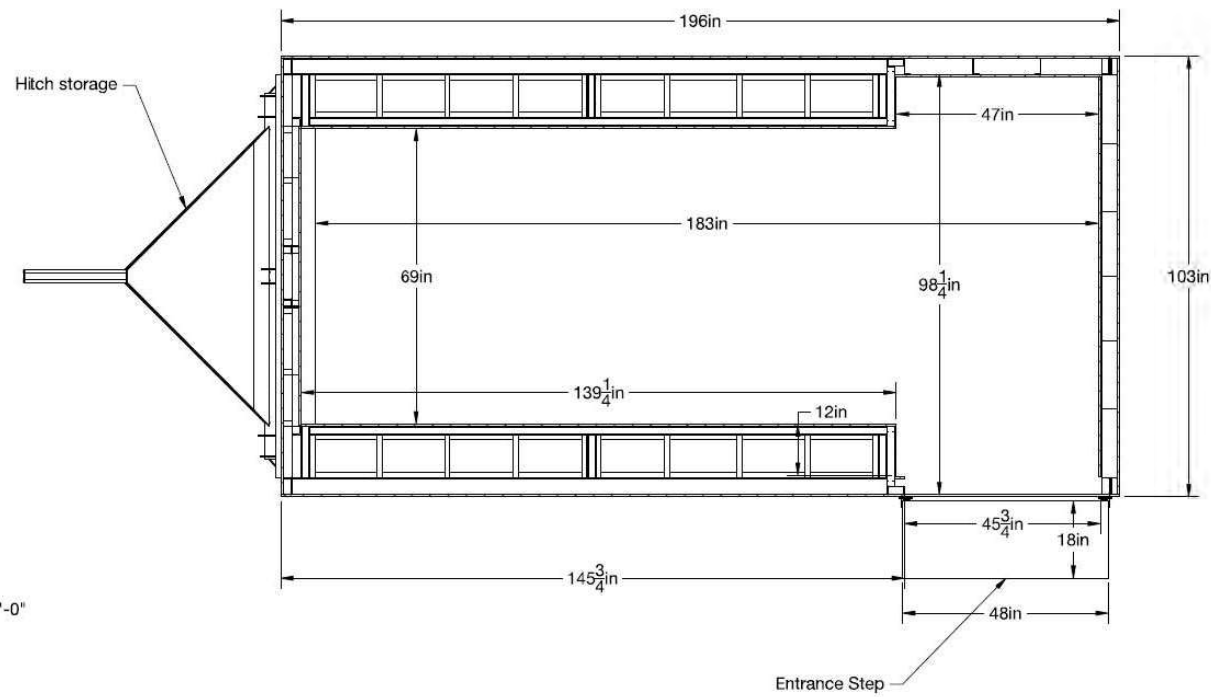
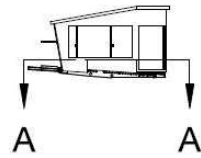
Wheel chair ramp available and personal concierge service provided as requested. *For Plantation, lobby service will also be available to accommodate customers as required



Security:

Includes fish eye camera, panic button, No cash. Security cabinet for all packages.





PLAN
Scale: $\frac{1}{2}" = 1'-0"$

flexetail

DHL Mobile

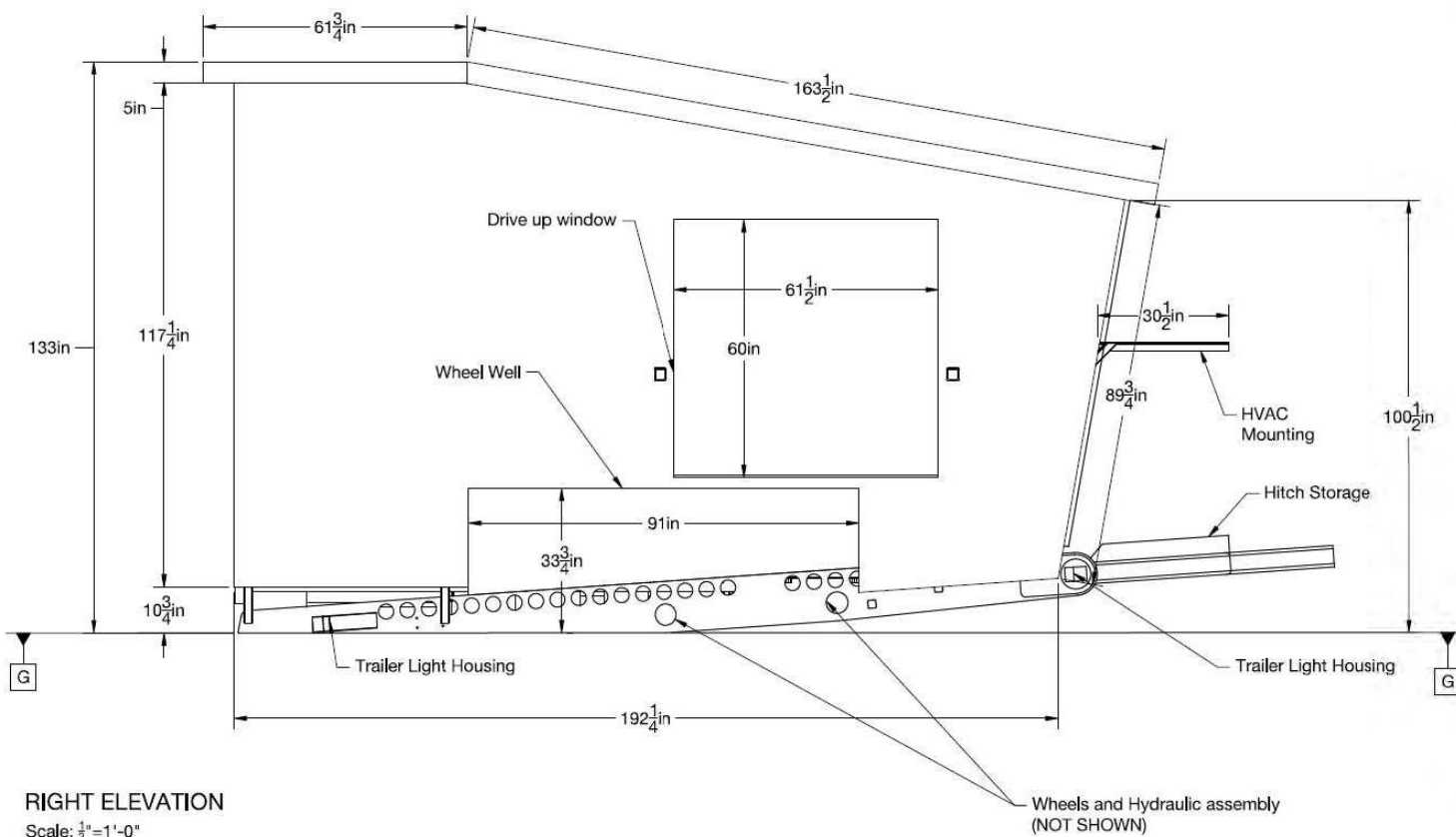
Notes:

Scale $\frac{1}{16}" = 1'-0"$

Structural Design

S101

Drawn By Aidan Symms
© 2020 flexetail LLC



DHL Mobile

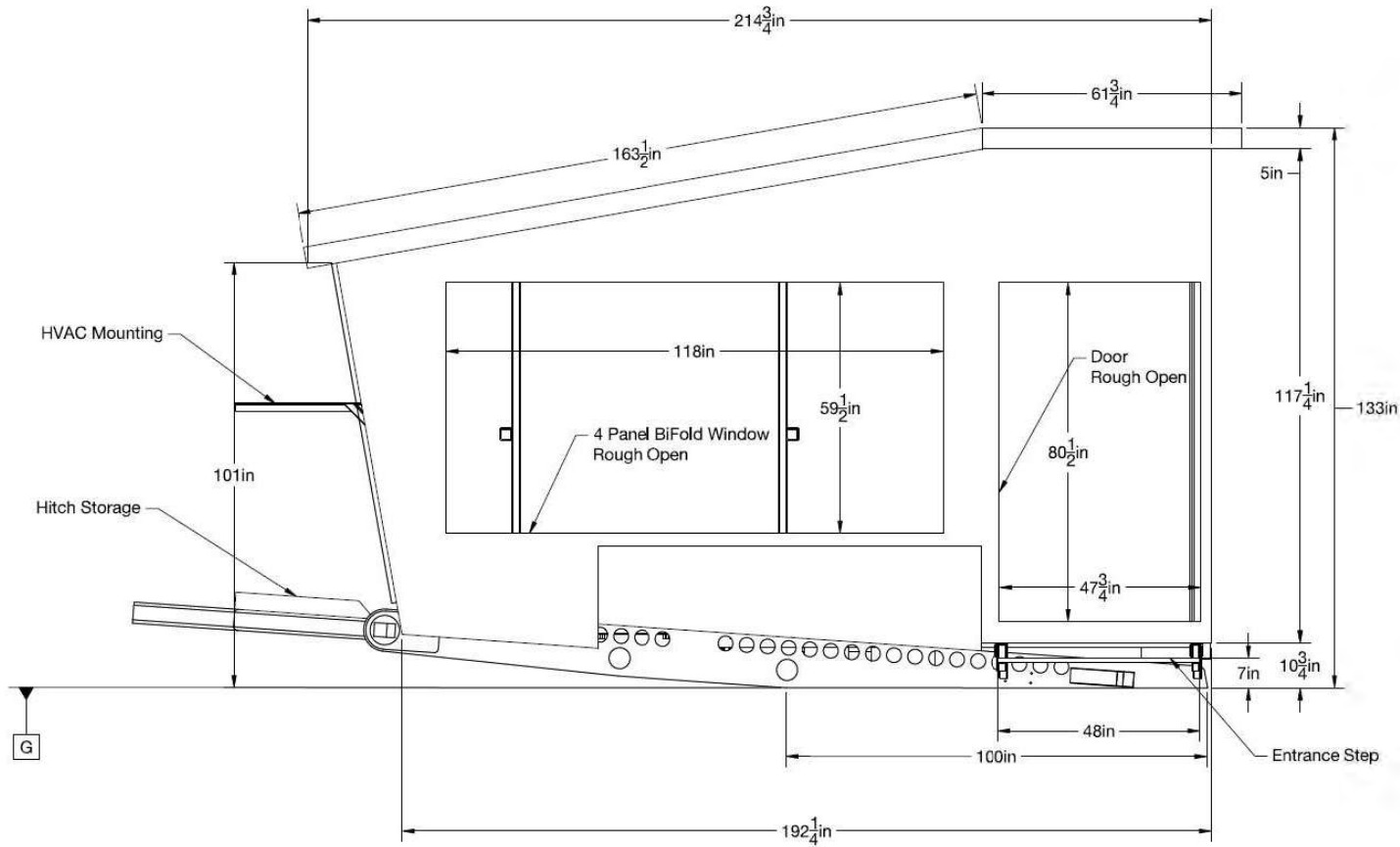
Notes:

Scale 1/2" = 1'-0"

Structural Design

S201

Drawn By Aidan Symis
© 2020 flexetail LLC



LEFT ELEVATION

Scale: $\frac{1}{2}$ " = 1'-0"

flexetail

DHL Mobile

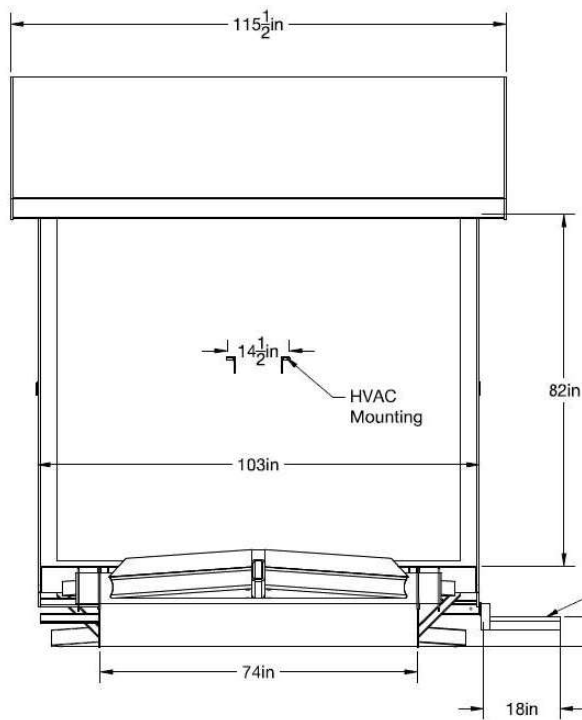
Notes:

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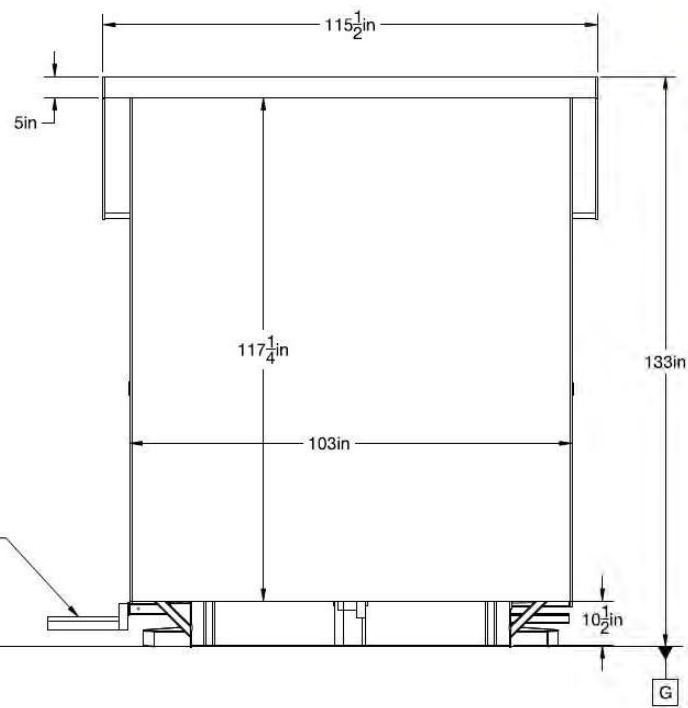
Structural Design

S202

Drawn By: Aidan Symms
© 2020 FLEXTAIL LLC



FRONT ELEVATION
Scale: $\frac{1}{2}" = 1'-0"$



REAR ELEVATION
Scale: $\frac{1}{2}" = 1'-0"$



DHL Mobile

Notes:

Scale $\frac{1}{2}" = 1'-0"$
Structural Design

S203

Drawn By Aidan Syms
19" © 2020 flexetail LLC

12 CABOT RD,
WOBURN, MA 01801

[illegible]

 Castillo Engineering <small>DESIGNING IN PERMIT</small>	
CASTILLO ENGINEERING SERVICES, LLC CEA # 1380 520 N. WYMORE ROAD, SUITE 200, MAITLAND, FL 32761 TEL: (407) 289-2175	
COPYRIGHTED BY CASTILLO ENGINEERING SERVICES, LLC	
REVISIONS	
DESCRIPTION	DATE REV
PROJECT INSTALLER:	
<div style="float: left; width: 30%;">  </div> <div style="float: right; width: 70%;"> <p style="margin-top: 0;">Ermacora s E Castillo</p> <p style="margin-top: 0;">2021.03.09</p> <p style="margin-top: 0;">13:20:42</p> <p style="margin-top: 0;">05:00'</p> </div> <div style="clear: both;"></div>	
PROJECT NAME	
<div style="float: left; width: 45%; color: blue; font-weight: bold;">DHL MOBILE 0.96KW PV SYSTEM</div> <div style="float: right; width: 55%; text-align: right;">12 CABOT RD, WOBURN, MA 01801</div> <div style="clear: both;"></div>	
SHEET NAME	
TITLE SHEET	
SHEET SIZE	
ANSI B 11" X 17"	
SHEET NUMBER	
G-001	

GENERAL ELECTRICAL AND EQUIPMENT NOTES

1. ALL ELECTRICAL WORK TO BE PERFORMED SHALL CONFORM TO ALL APPLICABLE CODES OF GOVERNMENT AGENCIES HAVING JURISDICTION OVER THE PROJECT. WHERE THESE CODES DO NOT APPLY, THE WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE 2014. APPLICABLE CODES SHALL INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING:

- 1.1. NATIONAL ELECTRICAL CODE (NFPA 70), 2017.
- 1.2. INSTITUTE OF ELECTRICAL AND ELECTRICAL ENGINEERS (IEEE)
- 1.3. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
- 1.4. ELECTRICAL SAFETY IN THE WORKPLACE (NFPA 70E)
- 1.5. UNDERWRITERS LABORATORY (UL)
- 1.6. INSULATED CABLE ENGINEERS ASSOCIATION (ICEA)
- 1.7. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- 1.8. AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
- 1.9. NATIONAL BUREAU OF STANDARDS
- 1.10. MA BUILDING 780 CMR
- 1.11. SAFETY ORDERS OF INDUSTRIAL ACCIDENT COMMISSION
- 1.12. RULES OF THE NATIONAL BOARD OF FIRE UNDERWRITERS
- 1.13. LOCAL ORDINANCES OF THE STATE
- 1.14. LOCAL ORDINANCES OF THE COUNTY OR CITY
- 1.15. REQUIREMENTS OF LOCAL UTILITY COMPANY

2. CONTRACTOR SHALL SUBMIT ELECTRICAL EQUIPMENT PRODUCT DATA SHEETS TO ENGINEER FOR REVIEW AND APPROVAL.

3. PROPOSED DEVIATIONS FROM DESIGN DOCUMENTS SHALL BE REVIEWED AND APPROVED BY ENGINEER.

4. CONTRACTOR SHALL INSTALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ELECTRICAL UTILITY LINES WHICH ARE TO REMAIN IN USE DURING CONSTRUCTION.

6. ALL MAJOR EQUIPMENT INTENDED FOR USE IN THE PV SYSTEM SHALL BE IDENTIFIED AND LISTED FOR THE APPLICATION.

7. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND EQUIPMENT THROUGHOUT THE JOBSITE TO ENSURE THEY ARE PROTECTED IN PLACE.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THEIR EMPLOYEES, PERSONNEL, SUBCONTRACTORS, AND EQUIPMENTS CONTINUOUSLY DURING ALL TIMES DURING CONSTRUCTION, INCLUDING AFTER HOURS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IMPLEMENT ADEQUATE SAFETY MEASURES AND TO ENFORCE THOSE MEASURES.

IDENTIFICATION/MARKINGS

1. CONTRACTOR MUST SUPPLY ALL REQUIRED SAFETY SIGNS AND LABELS, WHICH SHALL BE PERMANENTLY ATTACHED BY MECHANICAL MEANS. LABELS SHALL COMPLY WITH NEC ARTICLE 690 AND 705.12, AND OTHER APPLICABLE LOCAL CODES.

2. INVERTER IDENTIFICATION MARKINGS SHALL INDICATE INVERTER NUMBER AND BE PLACED ON THE FRONT OF THE INVERTER ENCLOSURE.

3. CONTRACTOR SHALL ASSIGN TO EACH WIRE AND CABLE A UNIQUE IDENTIFICATION NUMBER, NUMBERS SHALL BE ASSIGNED TO ALL CONDUCTORS HAVING COMMON TERMINALS.

4. AT A MINIMUM, IDENTIFICATION NUMBERING SHALL INCLUDE ORIGIN LOCATION & TERMINAL LOCATION.

5. APPLY ALL CONDUCTOR AND CABLE MARKERS BEFORE TERMINATION.

6. APPLY ALL CONDUCTORS IDENTIFICATION MARKING WITH HEAT SHRINKABLE TUBING. TUBING SHALL BE TIGHT ON THE WIRE AFTER INSTALLATION AND CHARACTERS SHALL FACE THE OPENING PANEL AND READ LEFT TO RIGHT OR TOP TO BOTTOM.

7. TORQUE MARKS SHALL BE PLACED ON ALL TERMINATION LUGS USING A COLOR DIFFERENT THAN MANUFACTURER.

8. ALL EQUIPMENT ANCHORS SHALL BE TORQUED MARKED BASED ON MANUFACTURER'S OR STRUCTURAL ENGINEER'S RECOMMENDATION.

9. DC CONDUIT AND RACEWAYS SHALL BE MARKED WITH "WARNING: PHOTOVOLTAIC POWER SOURCE" AT 10' INTERVALS.

WIRING & WIRING METHODS

1. EXPOSED PV MODULE WIRING SHALL BE TYPE PV WIRE, SUNLIGHT (UV) RESISTANT, 90° C, WE' RATED ALL EXPOSED CABLES SHALL BE SECURED WITH MECHANICAL OR OTHER SUNLIGHT RESISTANT MEANS.

2. CONDUCTOR INSULATION VOLTAGE RATINGS FOR 1000V STRINGS SHALL BE EQUAL OR GREATER THAN 1000V.

3. BENDING RADIUS SHALL BE PROVIDED BASED ON THE NEC. PROPER BENDING RADIUS MUST BE APPLIED BASED ON CONDUCTOR DIAMETER.

4. FIELD WIRING LARGER THAN 6 AWG THAT IS NOT COLOR CODED SHALL BE COLOR CODED AT BOTH ENDS WITH CODING TAPE TO IDENTIFY ITSELF.

5. GROUNDED CONDUCTORS SHALL BE COLOR CODED IN COMPLIANCE WITH NEC ARTICLE 200.6.

6. ALL GROUND CONDUCTORS SHALL BE COPPER, UNLESS NOTED OTHERWISE.

7. ALL LINE CONDUCTORS SHALL BE COPPER, UNLESS SPECIFICALLY NOTED OTHERWISE OR PLANS. CONTRACTOR SHALL CONFIRM WIRE SIZING WITH ENGINEER PRIOR TO USING A WIRE TYPE AND/OR SIZE DIFFERENT THAN WHAT IS SHOWN ON THESE PLANS.

8. ALL CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATIONS.

9. WHERE NECESSARY TO PREVENT PHYSICAL DAMAGE TO RACEWAY OR CABLE, UNDERGROUND INSTALLATIONS SHALL HAVE BACKFILL PROTECTION IN THE FORM OF GRANULAR OR SELECTED MATERIAL OR OTHER APPROVE MEANS.

10. EDGE PROTECTION MUST BE PRESENT IF A CONDUCTOR HAS A POTENTIAL OF BEING DAMAGED.

11. DIRECT-BURIED CONDUCTORS MUST BE PROTECTED FROM EARTH MOVEMENT AT ALL TRANSITIONS FROM CONDUIT TO DIRECT BURIAL VIA BELLENDOS, OAE, PER NEC 300.5.

12. PROPERLY COAT WIRES AND CABLES WITH PULLING COMPOUND BEFORE PULLING INTO CONDUITS AND PREVENT MECHANICAL DAMAGE TO CONDUCTORS DURING INSTALLATION.

13. ALL CAT 5 OR CAT 6 CABLES SHALL BE SHIELDED AND CONTAIN SHIELDED TERMINATION ENDS.

14. SPARE CONDUITS SHALL BE CAPPED, TAGGED WITH DESTINATION MARKER, AND PULL WIRES SHALL BE IN PLACED WITH A MINIMUM OF 250LBS TENSILE STRENGTH.

15. CONDUIT CONNECTORS SHALL BE WATER-TIGHT, COMPRESSION STYLE FITTINGS.

GROUNDING

1. A GROUNDING ELECTRODE SYSTEM SHALL BE PROVIDED, UNLESS OTHERWISE NOTED.

2. EXPOSED NON-CURRENT CARRYING METAL PARTS SHALL BE GROUNDED.

3. EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH NEC 250.122.

4. WHERE GROUNDING ELECTRODE CONDUCTORS ARE SPICED THEY SHALL BE IRREVERSIBLE.

ELECTRICAL ABBREVIATIONS

AF	AMPERES FRAME OF BREAKER	PN, BD	PANEL BOARD
AIC	AMPS INTERRUPTING CAPACITY	POI	POINT OF INTERCONNECTION
AMP, A	AMPERES	PR	PRIMARY
AT	AMPERES TRIP RATING OF BREAKER	PS	PRESSURE SWITCH
AUTO	AUTOMATIC	PT	POTENTIAL TRANSFORMER
ATS	AUTOMATIC TRANSFER SWITCH	PV	PHOTOVOLTAIC
AUX	AUXILIARY	PVC	POLYVINYL CHLORIDE
AWG	AMERICAN WIRE GAUGE	PWR	POWER
BKR	BREAKER	REC	RECEPTACLE
C	CELSIUS	RECPTS	RECEPTACLES
CAR	CABINER BOX	REQD	REQUIRED
CB	COMBINER BOX	SCH	SCHEDULE
CC	CENTER TO CENTER	SECT	SECTION
CKT	CIRCUIT	SHF	SHEET
CND	CONDUIT	SIC	SIGNAL
COM	COMMUNICATION	SK	START CONTACTOR COIL
CPT	CONTROL POWER TRANSFORMER	SP HTR	SPACE HEATER
CR	CONTROL RELAY	ST	SHUNT TRIP
CT	CURRENT TRANSFORMER	STA	STATION
CTRI	COPPER	STD	STANDARD
CU	COPPER	STL	STEEL
DAS	DATA ACQUISITION SYSTEM	STR	STRIP
DB	DIRECT BURIAL	SW	SWITCH
DISC	DISCONNECT	SWBD	SWITCHBOARD
DISTR	DISTRIBUTION	SWGR	SWITCHGEAR
DWG	DRAWING	SYS	SYSTEM
EGC	EQUIPMENT GROUND CONDUCTOR	SYM	SYMMETRICAL
ELEV	ELEVATION	TDOD	TIME DELAY ON
EMERG	EMERGENCY	TEMP	TEMPERATURE
ENCL	ENCLOSURE	TERM	TERMINAL
EQUIP	EQUIPMENT	TKR	TRACKER
EX	EXISTING	TS	TAMPER SWITCH
FEEDER	FEEDER	TSTAT	THERMOSTAT
FS	FLOW SWITCH	TYP	TYPICAL
FLEX	FLEXIBLE	UG	UNDERGROUND
FUT	FUTURE	UND	UNLESS NOTED OTHERWISE
FUSE	FUSE, CPT PRIMARY	UGPS	UNDERGROUND PULL SECTION
FUS	FUSE, CPT SECONDARY	VOC	OPEN CIRCUIT VOLTAGE
GE	GROUND ELECTRODE CONDUCTOR	W	WATTS
GROUND	GROUND	WHM	METER (WATT HOUR METER)
HH	HAND HOLE	WF	WEATHERPROOF
HOA	HAND-OFF-AUTOMATIC HEATER	XFMR	TRANSFORMER
HTR	HEATER		
HZ	HERTZ		
IG	ISOLATED GROUND		
ID	INDICATION		
INSTR	INSTRUMENT		
INV	INVERTER		
ISC	SHORT CIRCUIT CURRENT		
JB	JUNCTION BOX		
K	THOUSAND (Kilo)		
kv	KILOVOLTS		
kW	KILOWATTS		
kVA	KILOVOLT AMPERES		
kVAR	KILOVOLT AMPERES REACTIVE		
KWH	KILOWATT-HOUR		
KWHd	KILOWATT HOUR DEMAND		
LC	LOAD CENTER		
LT, LTS	LIGHT, LIGHTS		
LST	LIGHTING		
MAX	MAXIMUM		
MET	METEOROLOGICAL STATION		
MCB	MAIN CIRCUIT BREAKER		
MCM, Kcmil	THOUSAND CIRCULAR MILS		
MLO	MAIN LUG ONLY		
MN	MINIMUM		
MT	MOUNT		
MTD	MOUNTED		
MTG	MOUNTING		
NO, NOS	NUMBER, NUMBERS		
NP	NAME PLATE		
NTS	NOT TO SCALE		
OC	ON CENTER		
PB	PULL BOX		
PCH	POWER CONVERSION STATION		
PLC	PROGRAMMABLE LOGIC CONTROLLER		
PNL	PANEL		

ELECTRICAL SYMBOLS

	DISCONNECT
	CIRCUIT BREAKER
	INVERTER
	FUSE W/ CURRENT RATING
	PV MODULE
	METER
	CONTRACTOR
	MOV LIGHTING ARRESTOR
	EARTH GROUND
	THREE PHASE WYE CONNECTED SOLIDLY GROUNDED NEUTRAL
	THREE PHASE DELTA CONNECTED
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	COMBINER BOX
	JUNCTION BOX
	BRANCH CIRCUIT PANELBOARD, UNDER 250 VOLTS SURFACE MOUNTED
	BRANCH CIRCUIT PANELBOARD, UNDER 250 VOLTS FLUSH MOUNTED
	BRANCH CIRCUIT PANELBOARD, OVER 250 VOLTS SURFACE MOUNTED
	BRANCH CIRCUIT PANELBOARD, OVER 250 VOLTS FLUSH MOUNTED
	BRANCH CIRCUIT CONDUIT CONCEALED ABOVE CEILING OR IN WALL CONDUIT SHALL INCLUDE PHASE, NEUTRAL AND GROUND CONDUCTORS AS REQUIRED FOR CIRCUITS (UNLESS OTHERWISE NOTED)
	BRANCH CIRCUIT CONDUIT CONCEALED IN SLAB, UNDERGROUND OR UNDER FLOOR
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT STUB
	CONDUIT CONTINUED
	FLEXIBLE CONDUIT
	EXISTING TO REMAIN



DESIGNED BY MEMBER
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620 N. WYMORE ROAD,
SUITE 200
MAYLAND, FL 32751
TEL: (407) 288-9375

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REVISIONS		
DESCRIPTION	DATE	REV

PROJECT INSTALLER

PROJECT NAME

PROJECT NO. 2021.03.00
DATE 05/00/2021
TIME 13:21:11

PROJECT NAME

PROJECT NO. 2021.03.00

DATE 05/00/2021

TIME 13:21:11

PROJECT NAME

PROJECT NO. 2021.03.00

DATE 05/00/2021

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DATE 05/00/2021

TIME 13:21:11

PROJECT NAME

PROJECT NO. 2021.03.00

DATE 05/00/2021

TIME 13:21:11

PROJECT NAME

PROJECT NO. 2021.0

PROJECT DESCRIPTION:

03x320 SERAPHIM SOLAR: SEG-6MB-320WB (320W) MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 SYSTEM SIZE: 0.96 KW DC STC
 ARRAY AREA #1: 52.53 SQ FT.

EQUIPMENT SUMMARY:

03 SERAPHIM SOLAR: SEG-6MB-320WB (320W) MODULES
 01 GOALZERO (YETI 6000X) PORTABLE POWER STATION
 01 MC4 3WAY PARALLEL CONNECTOR



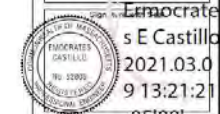
DESIGNED FOR: **Limocrate**
CASTILLO ENGINEERING SERVICES, LLC
 60492344
 620 N. WYOMING ROAD,
 SUITE 205,
 MAITLAND, FL 32751
 TEL: (407) 298-0075

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER



PROJECT NAME

DHL MOBILE
0.96KW PV SYSTEM
 12 CABOT RD,
 WOBURN, MA 01801

SHEET NAME

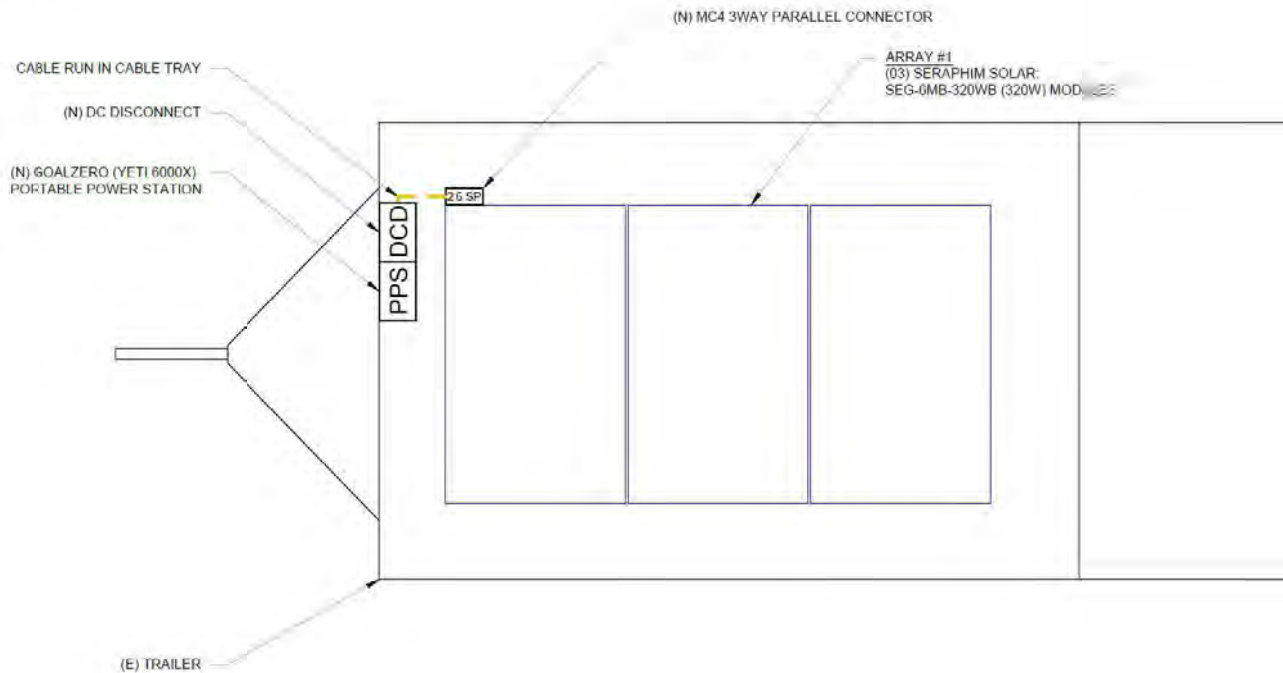
SITE PLAN

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

S-101



1

SITE PLAN

S-101

SCALE: 1/2" = 1'-0"

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 03 MODULES
 MODULE TYPE = SERAPHIM SOLAR, SEG-6MB-320WB (320W) MODULES
 MODULE WEIGHT = 38.5 LBS / 17.5 KG
 MODULE DIMENSIONS = 64.57" X 39.06" = 17.51 SF
 UNIT WEIGHT OF ARRAY = 2.19 PSF

EQUIPMENT SUMMARY
 03 SERAPHIM SOLAR, SEG-6MB-320WB (320W) MODULES
 01 GOALZERO (YETI 6000X) PORTABLE POWER STATION
 01 MC4 3WAY PARALLEL CONNECTOR

ARRAY AREA & ROOF AREA CALC'S						
ROOF	ROOF TYPE	ARRAY AREA (sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)	TILT	TRUSS SIZE
#1	EPDM	52.53	104.13	50.46	14°	2"x6"

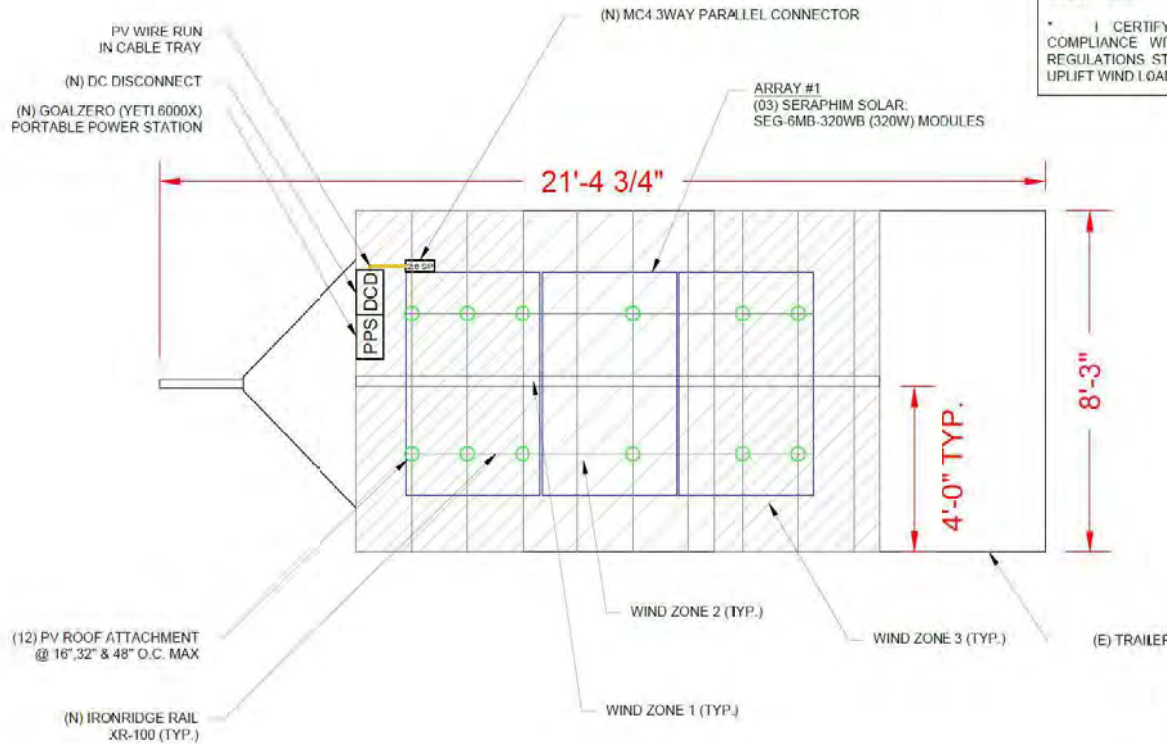
GENERAL INSTALLATION PLAN NOTES:

1) ROOF ATTACHMENTS TO TRUSSES SHALL BE INSTALLED AS SHOWN IN SHEET S-02 AND AS FOLLOWS FOR EACH WIND ZONE:

WIND ZONE 1: MAX SPAN 4'-0" O.C. - MAX CANTILEVER 1'-4"
 WIND ZONE 2: MAX SPAN 2'-8" O.C. - MAX CANTILEVER 0'-10"
 WIND ZONE 3: MAX SPAN 1'-4" O.C. - MAX CANTILEVER 0'-5"

2) EXISTING COMMERCIAL TRAILER HAS AN EPDM ROOF WITH MEAN ROOF HEIGHT IS 15 FT AND 2X8 ROOF TRUSSES SPACED 18" O.C. EXISTING ROOF SLOPE FOR SOLAR SYSTEM RETROFIT IS 14 DEGREES. CONTRACTOR TO FIELD VERIFY AND SHALL REPORT TO THE ENGINEER IF ANY DISCREPANCIES EXIST BETWEEN PLANS AND IN FIELD CONDITIONS.

* I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH MBC 780 CMR, AND ALL LOCAL AND STATE REGULATIONS. STRUCTURE WILL SAFELY ACCOMMODATE LATERAL AND UPLIFT WIND LOADS, SNOW LOADS, AND EQUIPMENT DEAD LOADS. *



LEGEND

- Z6 SP - MC4 3WAY PARALLEL CONNECTOR
- DCD - DC DISCONNECT
- PPS - GOALZERO (YETI 6000X) PORTABLE POWER STATION
- Green Circle - PV ROOF ATTACHMENT
- Line - TRUSSES
- Yellow Line - CONDUIT



1 ROOF PLAN & MODULES
 S-01 SCALE: 3/8" = 1'-0"

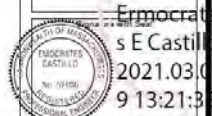


DESIGNED BY: ERMOCRATE
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DESCRIPTION	DATE	REV

PROJECT INSTALLER



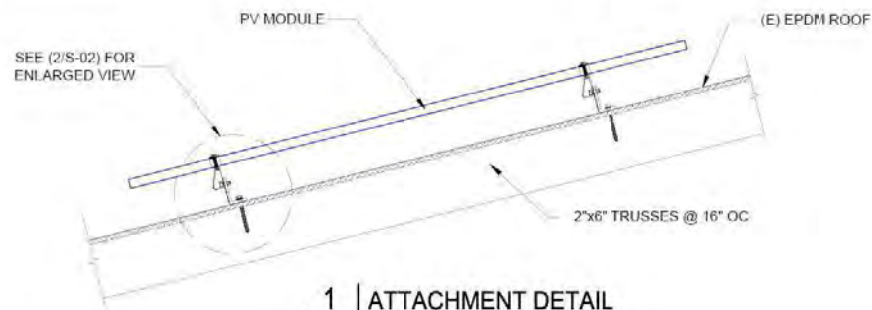
PROJECT NO. 05100

DHL MOBILE
 0.96KW PV SYSTEM
 12 CABOT RD,
 WOBURN, MA 01801

SHEET NAME
 ROOF PLAN & MODULES

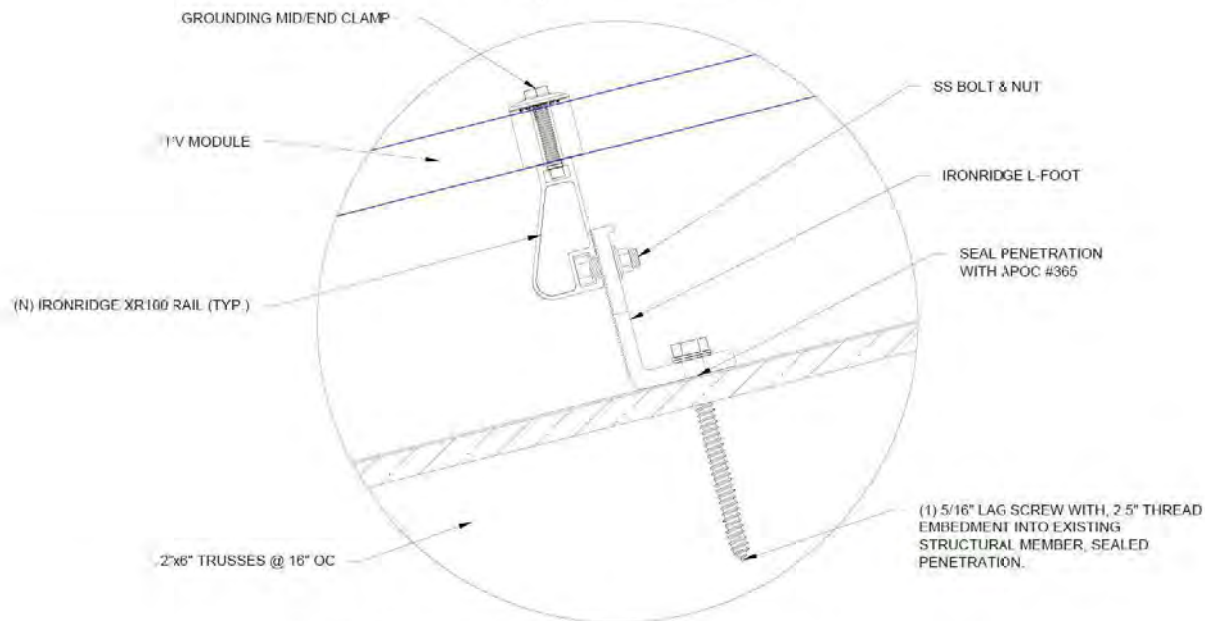
SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 S-102



1 | ATTACHMENT DETAIL

S-103 SCALE: 1" = 1' - 0"



2 | ATTACHMENT DETAIL (ENLARGED SECTION VIEW)

S-103 SCALE: 1" = 2"

Castillo
Engineering

DESIGNED BY: J. CASTILLO
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DESCRIPTION	DATE	REV

PROJECT INSTALLER



Ermocrate
s E Castillo
2021.03.0
9 13:21:43
05'00'

PROJECT NAME

DHL MOBILE
0.96KW PV SYSTEM

12 CABOT RD,
WOBURN, MA 01801

SHEET NAME
STRUCTURAL
ATTACHMENT
DETAILS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-103

Risk Category	I
Wind Speed ASD (mph)	120
Exposure Category	C
Mean Roof Height (ft)	15
Roof Slope (degrees)	15
Module Area (sq ft)	20
Ground Snow Load (psf)	50
Dead Load (psf)	3
Exposure Factor (C_e)	1.0
Temperature Factor (C_t)	1.0
Importance Factor (I_s)	1.0
Slope Factor (C_s)	0.91
Sloped Roof Snow Load (psf)	31.85
Kzt	1
Height Adjustment Factor, λ	1.21

Roof Zone	Pnet (30)	
1	13.6	-23
2	13.6	-38
3	13.6	-57.1

$$P_{net} = [AK]_{z:} P_{net}(30)$$

Roof Zone	Pnet (psf)	
1	34.29	-27.83
2	34.29	-45.98
3	34.29	-69.091

Roof Slope Calculator		
Rise	Run	Slope (")
3	12	14.0

Maximum Uplift per *fastener Wind Zone 1 (lbf)	306.1
Per American Wood Council - NDS Max Withdraw Load for 5/16" LAG with 2.5" Embedment	476

*Roof attachments w 2 rails at: 48 in O/C

Maximum Uplift per *fastener Wind Zone 2 (lbf)	337.2
Per American Wood Council - NDS Max Withdraw Load for 5/16" LAG with 2.5" Embedment	476

*Roof attachments w 2 rails at: 32 in O/C

Maximum Uplift per *fastener Wind Zone 3 (lbf)	253.3
Per American Wood Council - NDS Max Withdraw Load for 5/16" LAG with 2.5" Embedment	476

*Roof attachments w 2 rails at: 16 in O/C

780 CMR: STATE BOARD OF BUILDING REGULATIONS AND STANDARDS

16.00: continued

City/Town	SNOW LOADS		BASIC WIND SPEED, V_{mi} (mph)			SEISMIC PARAMETERS (g)	
	Ground Snow Load, P_g (psf)	Minimum Flat Roof Snow Load, P_f (psf)	Risk Category I	Risk Category II	Risk Category III or IV	S_s	S_i
W. Stockbridge ²	40	40	105	115	120	0.169	0.066
W. Tinbury	25	25	134	140	154	0.141	0.052
Westborough	50	35	115	125	136	0.186	0.066
Westfield	40	35	107	118	125	0.172	0.065
Westford	50	35	112	123	133	0.223	0.072
Wethampten	50	40	105	116	122	0.170	0.066
Westminster	60	35	109	120	130	0.194	0.069
Weston	40	35	116	126	137	0.207	0.069
Westport	30	30	128	139	149	0.172	0.059
Westwood	40	35	119	129	140	0.196	0.066
Weymouth	35	30	121	131	142	0.206	0.067
Whately	50	35	105	116	122	0.171	0.067
Whitman	35	30	123	133	144	0.194	0.064
Williamham	35	35	110	121	130	0.173	0.065
Williamsburg	50	40	105	116	121	0.170	0.067
Williamstown ²	50	40	105	115	120	0.176	0.070
Wilmington	50	30	115	125	136	0.233	0.073
Winchendon	60	35	107	117	125	0.197	0.071
Winchester	40	30	116	126	137	0.224	0.071
Windsor ²	60	40	105	115	120	0.169	0.067
Winthrop	40	30	118	129	140	0.222	0.070
Woburn	50	30	116	126	137	0.226	0.071
Worcester	50	35	114	124	134	0.180	0.066
Worthington	60	40	105	115	120	0.169	0.067
Wrentham	40	35	120	130	141	0.184	0.064
Yarmouth	30	25	132	140	152	0.149	0.054

NOTES:

1. The design flat roof snow load shall be the larger of the calculated flat roof snow load using P_g or the value of P_f listed in this table.
2. Special Wind Region. Local conditions may cause higher wind speeds than the tabulated values. See ASCE/SEI 7.

REVISIONS		
DESCRIPTION	DATE	REV

PROJECT INSTALLER



Emilio E. Castillo
2021.03.09 13:22:06

PROJECT NO: 05100

DHL MOBILE
0.96KW PV SYSTEM

12 CABOT RD,
WOBBURN, MA 01801

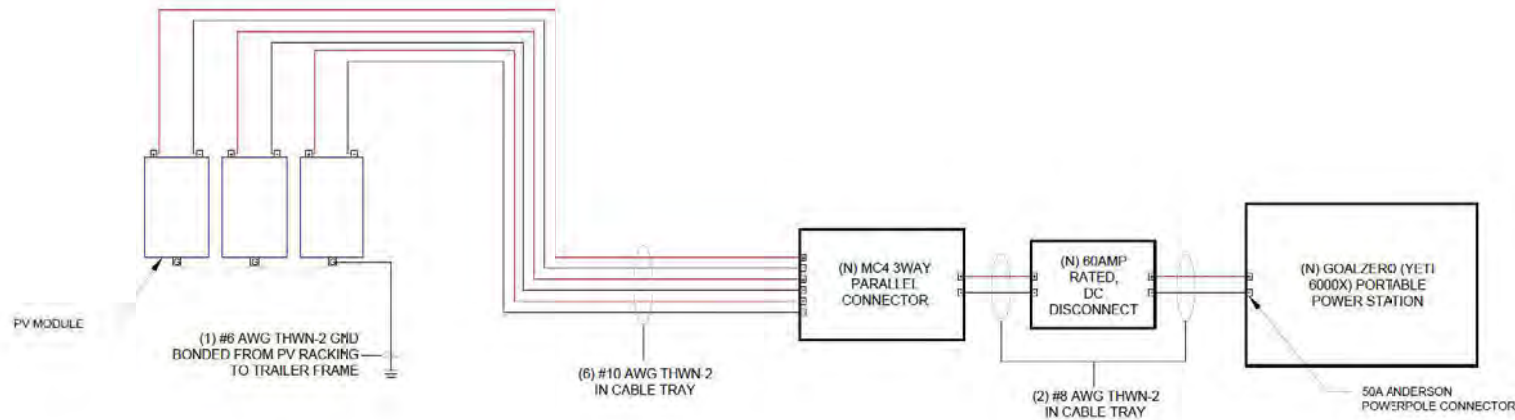
SHEET NAME
STRUCTURAL CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-104

SOLAR ARRAY (0.96 KW-DC-STC)
 (03) SERAPHIM SOLAR SEG-6MH-320WB (320W) MODULES
 (01) BRANCH OF 3 MODULES

NOTE:
 1. SUBJECT PV SYSTEM HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2017, AND THOSE SET FORTH BY THE MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES, INCLUDING MAXIMUM NUMBER OF MODULE STRINGS, MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE.
 2. SYSTEM DESIGNED PER NEC 710 AND 712.



Castillo Engineering
 CASTILLO ENGINEERING SERVICES, LLC
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 (407) 298-0515

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REVISIONS		
DESCRIPTION	DATE	REV

PROJECT INSTALLER



Emocrate
 s E Castillo
 2021.03.0
 9 13:22:15

PROJECT #05100
DHL MOBILE
0.96KW PV SYSTEM
 12 CABOT RD,
 WOBURN, MA 01801

SHEET NAME
**ELECTRICAL
 LINE DIAGRAM**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
E-101

DC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO MC4 3 WAY CONNECTOR

EXPECTED WIRE TEMP (In Celsius)	34*
TEMP. CORRECTION PER 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	1.0
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	15.66A
1.25 X 1.25 X ISC	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	38.4A
TEMP. CORRECTION PER 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (15.66A) otherwise increase the size of the conductor and its ampacity	

FROM MC4 3WAY CONNECTOR TO POWER STATION

EXPECTED WIRE TEMP (In Celsius)	34*
TEMP. CORRECTION PER 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	1.0
CIRCUIT CONDUCTOR SIZE	8 AWG
CIRCUIT CONDUCTOR AMPACITY	55A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	46.97A
3 X 1.25 X 1.25 X ISC	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC 310.15(B)(2)(a)	52.80A
TEMP. CORRECTION PER 310.15(B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (46.97A) otherwise increase the size of the conductor and its ampacity	

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT. THE TERMINALS ARE RATED FOR 75 DEGREES "C".
- THE WIRES ARE SIZED ACCORDING TO NEC 110.14.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE.
- UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
- MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
- RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
- CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
- CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).

POWER STATION SPECIFICATIONS	
MANUFACTURER	GOAL ZERO
MODEL #	YETI 6000X
NOMINAL AC POWER	6 KW
NOMINAL OUTPUT VOLTAGE	110V
NOMINAL OUTPUT CURRENT	16.5A

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER	SCRAPHIM
MODEL #	SEC-6MB-320WB
PMAX	320W
VMP	33.0V
IMP	7.70A
VOC	40.6V
ISC	10.02A
MODULE DIMENSION	64.5" L x 39.06" W x 1.37" D (In Inch)

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



CASTILLO ENGINEERING
SERVICES, LLC
GOAN 2546
1020 N. WYOMING RD. #473,
SUITE 200,
MAITLAND, FL 32751
TEL: (407) 298-2072

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REVISIONS		
DESCRIPTION	DATE	REV

PROJECT INSTALLER

Ermocrate
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2021.03.0
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05:00

PROJECT NAME
DHL MOBILE
0.96KW PV SYSTEM
12 CABOT RD,
WOBURN, MA 01801

SHEET NAME
WIRING
CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-102

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

LABEL LOCATION:
CONDUIT, CABLE TRAY
(ADDITIONAL EQUIPMENT THAT
CONTAINS PV SOURCE WIRES
(PER CODE: NEC690.31(G)(3))

**RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYTEM**

LABEL LOCATION:
DC DISCONNECT
(PER CODE: NEC690.56(C)(3))

- ADHESIVE FASTENED SIGNS:
- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
 - WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 (NEC 110.21(B) FIELD MARKING).
 - ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT (IFC 605.11.1.3)

**PHOTOVOLTAIC SYSTEM DC DISCONNECT
RATED DC OPERATING CURRENT 29.1 AMPS
DC NOMINAL OPERATING VOLTAGE 33.0 VOLTS**

LABEL LOCATION:
DC DISCONNECT
(PER CODE: NEC690.54)

POWER STATION

MAXIMUM SYSTEM VOLTAGE (VOC)	47.10	V
MAXIMUM CIRCUIT CURRENT (Isc)	46.97	A
MAXIMUM RATED OUTPUT OF DC TO DC CONVERTER (Idc)	N/A	A

LABEL LOCATION:
POWER STATION
(PER CODE: NEC690.53)

**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN
SWITCH TO THE
"OFF" POSITION TO
SHUT DOWN
CONDUCTORS OUTSIDE
THE ARRAY.
CONDUCTORS WITHIN
THE ARRAY REMAIN
ENERGIZED IN SUNLIGHT



LABEL LOCATION:
DC DISCONNECT
(PER CODE: NEC 690.56(C)(1)(a), IFC 605.11.3.1(1))

Castillo Engineering

DESIGNED TO PERMIT:
CASTILLO ENGINEERING
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SUITE 200
MAYLAND, TX 77751
TEL: (409) 966-0055

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DESCRIPTION	DATE	REV

PROJECT INSTALLER



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2021.03.0
9 13:22:40

PROJECT NAME

**DHL MOBILE
0.96KW PV SYSTEM**

12 CABOT RD,
WOBURN, MA 01801

**SHEET NAME
SYSTEM
LABELING**

**SHEET SIZE:
ANSI B
11" X 17"**

**SHEET NUMBER
E-103**

SEG-6MB-(300-320)W/B SERIES 6 INCH 60 CELLS



Safety



Resistance to salt mist corrosion at your request



Resistance to ammonia corrosion at your request



Product is certified by UL 1703

Reliability



Anti-PID products using advanced module technology



Works for company to pass "Threshold Test" and "On-site Power Measurement" validation certificate



Service products

Performance



High efficiency and enhanced module durability



Outstanding power output capability at low irradiance

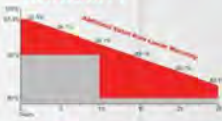


Withstand up to 2400Pa wind and 5400Pa snow loads (EC), long lasting

300-320W



WARRANTY



15 YEARS

Guarantee on product material and workmanship

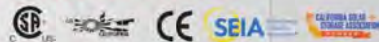
25 YEARS

Linear power output warranty

MANAGEMENT SYSTEM

ISO 9001: Quality management system
ISO 14001: Standard for environmental management system
OHSAS 18001: International standard for occupational health and safety assessment system

PRODUCT CERTIFICATES



INSURANCE



SEG-6MB-(300-320)W/B SERIES 6 INCH 60 CELLS

W: WHITE BACKSHEET / SILVER FRAME PRODUCTS
WB: WHITE BACKSHEET BLACK SILVER FRAME PRODUCTS
BW: BLACK BACKSHEET WHITE SILVER FRAME PRODUCTS
B: BLACK BACKSHEET / SILVER FRAME PRODUCTS

Electrical Characteristics(Std)

Module Type	SEG-6MB-300W 160-166x66x3mm	SEG-6MB-310W 166-172x66x3mm	SEG-6MB-315W 172-178x66x3mm	SEG-6MB-320W 178-184x66x3mm	SEG-6MB-325W 184-190x66x3mm
Maximum Power at STC P_{max} (W)	300	310	315	320	325
Open Circuit Voltage V_{oc} (V)	36.7	36.8	37.1	37.3	37.5
Short Circuit Current I_{sc} (A)	9.95	9.75	9.65	9.62	9.52
Maximum Power Voltage V_{mp} (V)	32.1	32.3	32.5	32.6	32.9
Maximum Power Current I_{mp} (A)	9.35	9.45	9.51	9.51	9.55
Module Efficiency STC η_m (%)	18.44	18.75	18.86	18.98	19.07
Power Tolerance (W)	(±4.3%)				
Maximum System Voltage (V)	1500 or 1500Vdc				
Maximum Series Fuse Rating (A)	20				
Fire Performance	Type2 or Type(NL)				

Electrical Characteristics(NCCT)

Module Type	SEG-6MB-300W 160-166x66x3mm	SEG-6MB-310W 166-172x66x3mm	SEG-6MB-315W 172-178x66x3mm	SEG-6MB-320W 178-184x66x3mm	SEG-6MB-325W 184-190x66x3mm
Maximum Power at NCCT P_{max} (W)	223	228	230	234	238
Open Circuit Voltage V_{oc} (V)	36.7	36.8	37.1	37.3	37.5
Short Circuit Current I_{sc} (A)	7.92	7.91	7.96	8.06	8.14
Maximum Power Voltage V_{mp} (V)	30.3	30.4	30.7	30.9	31.2
Maximum Power Current I_{mp} (A)	7.36	7.44	7.36	7.58	7.64

Temperature Characteristics

Power/Temperature Coefficient	-0.35 %/°C
V _{oc} Temperature Coefficient	-0.35 %/°C
I _{sc} Temperature Coefficient	+0.05 %/°C
Operating Temperature	-40~+85 °C
Nominal Operating Cell Temperature (NOCT)	45±2 °C

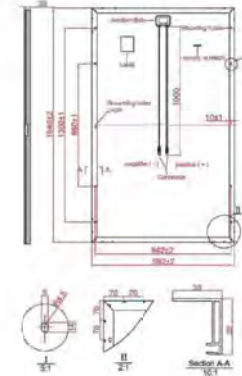
Packing Configuration

	160W-300W (Standard 57x26.5x1.37 inch)	
Container	30'GP	40'GP
Pieces per Pallet	30	30
Pieces per Container	12	36
Pieces per Container	360	360

Mechanical Specifications

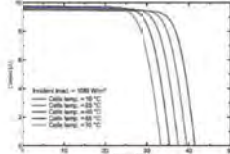
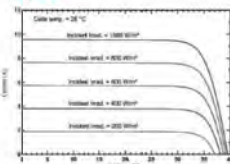
External Dimensions	1660 x 960 x 35 mm (65.35 x 37.79 x 1.37 inch)
Weight	17.5 kg (38.6 lbs)
Solar Cells	PERC Monocrystalline, 180 Pitches (cells)
Finger Glass	3.2 mm Anti-reflecting tempered glass, low iron
Frame	Anodized aluminum alloy
Junction Box	IP65
Cable Glands	UV-resistant cable length: 472.61 mm
Connector	MC4 Compatible

STC: Irradiance 1000 W/m², module temperature 25°C, AM=1.5
NOCT: Irradiance 800 W/m², ambient temperature 25°C, wind speed: 1 m/s
Specifications are subject to change without further notification



* All Dimensions in mm
* The above drawing is a practical representation of the product.

I/V Curve



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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Signature with Seal

PROJECT NAME

DHL MOBILE
0.96KW PV SYSTEM
12 CABOT RD.,
WOBBURN, MA 01801

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-01

Specifications are subject to change without notification SEG-DS-EN-30220V1.0 © Copyright 2019 Seraphim

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GOAL ZERO YETI 6000X TECHNICAL SPECIFICATIONS

Technical Specifications

Charge times	
Maximum input (standard)	11 hrs
Goal Zero Ranger 300	24-48 hrs
Goal Zero Boulder(3X) 200 Briefcase	12-14 hrs
Goal Zero Boulder (6X) 200 Briefcase	11-12 hrs
Battery:	
Cell Chemistry	Li-ion NMC
Pack Capacity	6010Wh (10.8V, 557Ah)
Single Cell Equivalent: Capacity	1668Ah @ 3.6V
Lifecycles	500 Cycles to 80% capacity (Discharge rate: 1C, Full charge/discharge, Temp: 25C)
Shelf-life	Charge every 3-6 months
Management System	MPPT charge controller
Ports:	
USB-A Port (output)	5V, up to 2.4A (12W max), regulated
USB-C Port (output)	5 - 12V, up to 3.0A (18W max), regulated
USB-PD Port (output)	5 - 20V, up to 3.0A (60W max), regulated
6mm Port (output, 6mm)	12V, up to 10A (120W max), regulated
12V Car Port (output)	12V, up to 13A (160W max), regulated
12V Power Pole port (output)	12V, up to 30A (360W max), regulated
120V AC Inverter (output, pure sine wave)	120VAC 60Hz, 16.5A (2000W, 3500W surge)
230V AC Inverter (output, pure sine wave) UNIVERSAL OR AUSTRALIA (TYPE 1) AC PLUGS	230VAC 50Hz, 8.5A (2000W, 3500W surge)
Charging Port (input, 8mm)	14-50V, up to 10A (120W max)
Power Pole Charging Port (input)	14-50V, up to 50A (600W max)
Expansion Module port	Covered port under the lid. To be used with Goal Zero expansion modules only.

10

Technical Specifications

WiFi:	
RF Certification	FCC/CE/IC/TELEC/KCC/SRRC/NCC
Protocols	802.11 b/g/n (802.11n up to 150 Mbps)
Frequency Range	2.4-2.5 GHz
Bluetooth:	
Protocols	Bluetooth Low Energy
General:	
Weight (Yeti only)	97.35 lbs (44.16 kg)
Weight (cart only)	106.1 lbs (48.11 kg)
Dimensions (Yeti only)	15.25 x 10.23 x 17 in (38.74 x 25.98 x 43.2 cm)
Dimensions (Yeti & Roll Cart)	20.5 x 14.6 x 19.01 in (51.99 x 36.98 x 48.28 cm)
Operating Usage Temp.	32-104 F (0-40 C)
Certs	RoHS REACH CE FCC
Warranty	24 months

11

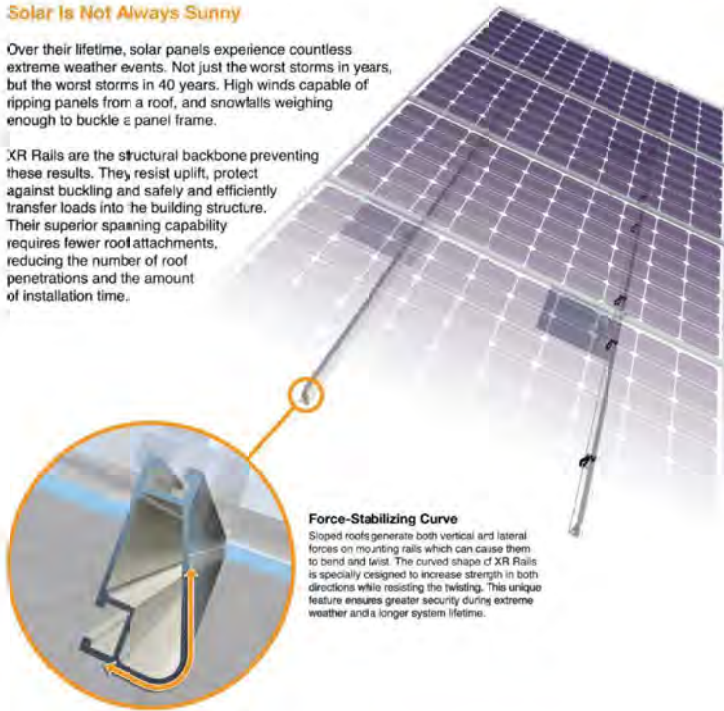
		
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PROJECT NAME <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> DHL MOBILE 0.96kW PV SYSTEM </div> <div> 12 CABOT RD, WOBURN, MA 01801 </div> </div>		
SHEET NAME DATA SHEET		
SHEET SIZE ANSI B 11" X 17"		
SHEET NUMBER DS-02		



Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs



XR Rails are compatible with FlashFoot and other pitched roof attachments.



IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



Tech Brief

XR Rail Family

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 5 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5'-4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						



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MAULAND, FL 32751
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DESCRIPTION	DATE	REV

PROJECT INSTALLER

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PROJECT NAME

DHL MOBILE
0.96kW PV SYSTEM
12 CABOT RD.,
WOBURN, MA 01801

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-03



AP 365 ETERNA-FLASH® ULTRA ALL WEATHER RUBBERIZED FLASHING CEMENT DATA SHEET

COMPLIANCE: Exceeds performance requirements of ASTM D3409 and ASTM D4586, TYPE I. Miami-Dade County Control Product Approved.

DESCRIPTION: APOC® 365® ETERNA-FLASH® All Weather Rubberized Flashing Cement is a high performance flashing cement specially formulated for the professional roofer. APOC 365 is an extremely flowable, rubber modified mastic that provides superior elasticity and adhesion to wet surfaces. This product contains special adhesion promoters that allow 365 to bond underwater in the pouring rain. APOC 365 Eterna-Flash is manufactured with select asphalt, rubber, solvent and fibers to provide an "EZ Spread" and highly durable patching compound for use under the harshest weather conditions. APOC 365 is the ultimate repair product and can be used to patch spills, seams, cracks and holes in bonded gravel, mineral surfaced cap sheet, smooth surface asphalt and shingle roofs. It will seal areas around chimneys, vent pipes, gravel guards, down spouts, cracks in concrete and many other areas.

PREPARATION: Download the APOC APP for detailed installation instructions, videos, tips and specifications. **Completely read all application instructions and check weather conditions prior to starting any work.** All surfaces must be completely clean, have proper drainage and be free of surface rust, dust and any other foreign matter. For longevity and UV protection, it is recommended to prime repairs with the application of a reflective coating after they have cured for 30 - 90 days. **DO NOT HEAT OR THIN** products. Not for use on single ply membranes.

FOR BEST RESULTS: Apply when surface temperatures are between 40 °F and 120 °F. On vertical surfaces in hot temperatures, product should be applied in thin layers. In colder weather, product should be stored in heated room (65 °F to 80 °F) at least 24 hours prior to application. Product formulated to be used year-round. For longer lasting repairs, use APOC Rubberized, Polymer, Acrylic or Moisture Cured Technologies.

FALL PROTECTION WARNING: Always use personal fall protection devices and follow procedures in accordance with OSHA and local regulatory requirements when walking or working on roofs. Use safety equipment such as tie-offs, safety lines, fully harnessed, toe boards and ladders. Duly, dump in wet conditions as well as certain knives can result in slippery surfaces and create a fall hazard. Always be cognizant of where you are in relation to your surroundings, including but not limited to the edge of the roof, a/y projections, skylights and any other objects which could cause you to slip or fall. Falling from a roof can result in serious harm or death.

APPLICATION: For exterior use only. Protective clothing, gloves and eyewear should be used during application of these products. Apply with a trowel or putty knife. Work material to an even consistency over and into the area to be repaired. Using the "3-course" method, apply cement 1/8" thick, two or three inches beyond the problem area. Next, reinforce the repair by embedding a layer of APOC reinforcing fabric into the repair. Rough fabric into cement ensuring it is fully saturated from the bottom side up. Finally, cover the fabric with an additional layer of cement. Form a finished edge with cement where chimneys, vent pipes, and other projections meet the roof line.

COVERAGE RATE: Approximately 12.8 sq. ft. per gallon when applied 1/8" thick.

CLEAN-UP: Clean tools with paint thinner or mineral spirits.

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Gardner-Gibson, Inc.
P.O. Box 5449, Tampa, FL 33675

See SDS for more info

TYPICAL PHYSICAL & PERFORMANCE CHARACTERISTICS:

Weight Per Gallon	8.5 - 9.0 lbs.
Adhesion Underwater	Excellent
Consistency	Trowel
Application Temperatures	40 °F - 120 °F
Clean-up Tools	Paint Thinner, Mineral Spirits

Approx. Shipping Weights: (nets All square weights include container)

10 fl. oz. tube (295 mL)	1 lb.
1 gallon (3.8L)	10 lbs.
(4) 1 gallon containers/case	41 lbs.
3 gallons (11.3 L)	33 lbs.

VOC: 300 g/L (regulatory)

HANDLING PRECAUTIONS: Store product in the cargo area of vehicle, and secure on top of 6 mil plastic (thorling to prevent damage due to accidental spills or loosening of lids. Product safety information required for safe use is not included. Before handling, read product safety data sheets and container labels for safe use and for physical and health hazard information. Safety Data Sheets are available on the APOC website at www.apoc.com, the APOC APP, by contacting APOC at info@apoc.com or calling (813) 248-2101.

LIMITED WARRANTY AND DISCLAIMER: To the best of our knowledge, the technical data contained herein is true and accurate at the date of issuance and is subject to change without prior notice. User must contact APOC to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied.

APOC Roofing Systems, Inc. (herein "APOC") hereby warrants to the original purchaser, contingent upon original proof of purchase, that this product will be free from any and all manufacturing defects that may materially and adversely affect the product's performance for a period of one (1) year from the date of original purchase ("Warranty Period"). Product must be applied in accordance with the proper application procedures, not for the intended use as stated on the label. Proper preparation and drying conditions must be observed to achieve correct results. Should a manufacturing defect materially and adversely affect the product's performance, APOC shall, within its sole discretion and upon receipt of Purchaser's timely written notice within the Warranty Period, provide replacement product(s) or refund the purchase price of the defective product. THIS LIMITED WARRANTY IS PURCHASER'S SOLE AND EXCLUSIVE WARRANTY AND REPLACES ALL OTHER WARRANTIES, CONDITIONS, REPRESENTATIONS AND GUARANTEES, WHETHER EXPRESS OR IMPLIED, WHETHER BY STATUTE, AT LAW OR IN EQUITY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. This limited warranty does not cover labor or installation costs, water damage, consequential damages or incidental damages. Under no circumstances will APOC be liable for any amount in excess of the product purchase price. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Direct all warranty claims in writing along with original proof of purchase to APOC, c/o Warranty Claims Department, P.O. Box 5449, Tampa, FL 33675. The exclusive venue for any legal action arising out of the purchase of this product or this warranty shall be held in a court of competent jurisdiction within Hillsborough County, Florida. Florida law shall govern. For additional Limited Warranty information, visit www.apoc.com/pages/warranty.

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F-18



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SERVICES, LLC
COA # 28341
620 N. WYMORE ROAD
SUITE 200
MAITLAND, FL 32751
TEL: (407) 289-2878

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Signature with Seal

PROJECT NAME

DHL MOBILE
0.96KW PV SYSTEM
12 CABOT RD,
WOBBURN, MA 01801

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-04

November 18, 2020

Aidan Syms - VP of Design & Manufacturing
Flexetail LLC
aidan@flexetail.com
17 Philmore rd
Newton, Massachusetts 02458
774.270.3240

**Subject: Temporary DHL Mobile Service Point for the City of Alexandria
TAM Project No. 20679-W**

Attachments: a) Plans
b) DOT Trailer Certificates
c) Registrations

Dear Mr. Syms,

In accordance with your request, we have completed a review of the mobile DHL Trailer that will be placed on a temporary basis in Alexandria, Virginia. We were requested to review the trailer, placement, use, and applicable building codes for the mobile trailer.

BACKGROUND:

The DHL Mobile Service point is a steel framed structure built on a hydraulic steel commercial trailer. The super structure is composed of hollow structural steel tubes with cold formed steel infill studs and then sheathed with Zip Sheathing.

The commercial trailer is a Lifetime Lo Riser Model IPT4-516 Hydraulic Inclining Platform Trailer which has a load capacity of 10,000 lbs and weighs approximately 3,500 pounds. This trailer is manufactured and sold by a The Advance Metalworking Company in Illinois who states that the specific trailer meets all Federal Department of Transportation requirements for the trailer.

It is also our understanding that this trailer is currently registered and licensed with the Massachusetts Department of Transportation. License Plate number E33682 and VIN 1LPTD1627HKFEB035.

The projected floor plan of the trailers is approximately 140 square feet and has an interior space of 97 square feet when the wall thickness and wheel wells are accounted for.

LOADING AND CODE REVIEW:

This structure will be parked for temporary events and the moved and stored like a normal trailer. While parked, it will be used for less than 180 days and therefore falls into the Temporary Structure's requirement of the Current Virginia Construction Code (2015) and the ICC International Building Code.

The construction of the building falls into category VB due to the combustible materials selected for the exterior sheathing per Chapter 6. For use group of Assembly similar to and exhibit gallery or is used for Mercantile, the more stringent occupant load is 30net area per occupants. This places the trailer at 5 occupants; as per Chapter 3 and Table 1004.1.1

Per chapter 31 section 31.03b structures that cover an area of over 120 square feet and an occupancy over 10 persons a building permit will be required. This useable space of the trailer is just under the 120 occupiable square feet and the maximum occupancy of the trailer is 5 persons. Therefore it appears that a location permit is not required for this structure, unless the authority having judication requires it for other reasons.

Due the temporary use of the structure design loads can be reduced per ASCE 7-10. A 10-year return period wind event results in an ultimate wind speed of 76 miles per hour, a similar sized permanent structure would result in an ultimate design wind speed of 115 mph. The change in forces of these two speeds is the temporary structure is less than half of the permanent loads.

CONCLUSIONS:

1. Based on the stated DOT specification, the trailer registrations, trailer load capacity, type of superstructure construction, the temporary use and temporary design loads it is our opinion that structure as a whole can be considered as part of a manufactured system for road use and not a standard building.
2. Based on the useable space and occupant load it is our opinion that this structure falls outside the requirement of building permits per Temporary Structures Section 3103.1.2 in the 2015 Virginia Construction Code.
3. Based on the weight of the trailer combined with the calculated weight of the framing above and the fact the hydraulic pistons raise the trailer's wheels off the ground it is our opinion that the trailer is stable and will remain stationary under normal anticipated temporary structure wind and lateral load events when placed on level ground.

In the event of a known hurricane or major wind event, the mobile aspect of the trailer will result in the need to be relocated either indoors or anchored in a suitable storage location.

DISCLAIMERS:

Our comments are limited to the conditions noted and those that were declared in this report. We make no claim either stated or implied that all conditions were evaluated, or that a detailed

analysis of the building or structure was performed. Should additional information be uncovered or made available, we retain the right to revise or supplement our report accordingly.

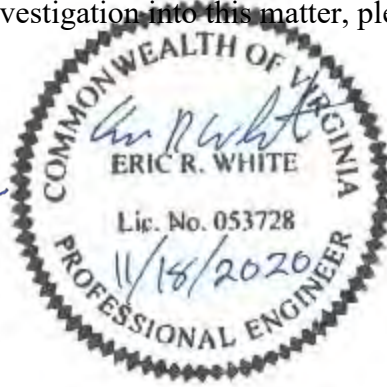
This report is furnished as privileged and confidential to the addressee. Release to any other company, concern, or individual is solely the responsibility of the addressee.

We appreciate the opportunity to provide professional services to you. If you have any questions or need additional information or investigation into this matter, please call us at (757) 564-4434.

Sincerely,



Eric R White PE
Production Manager



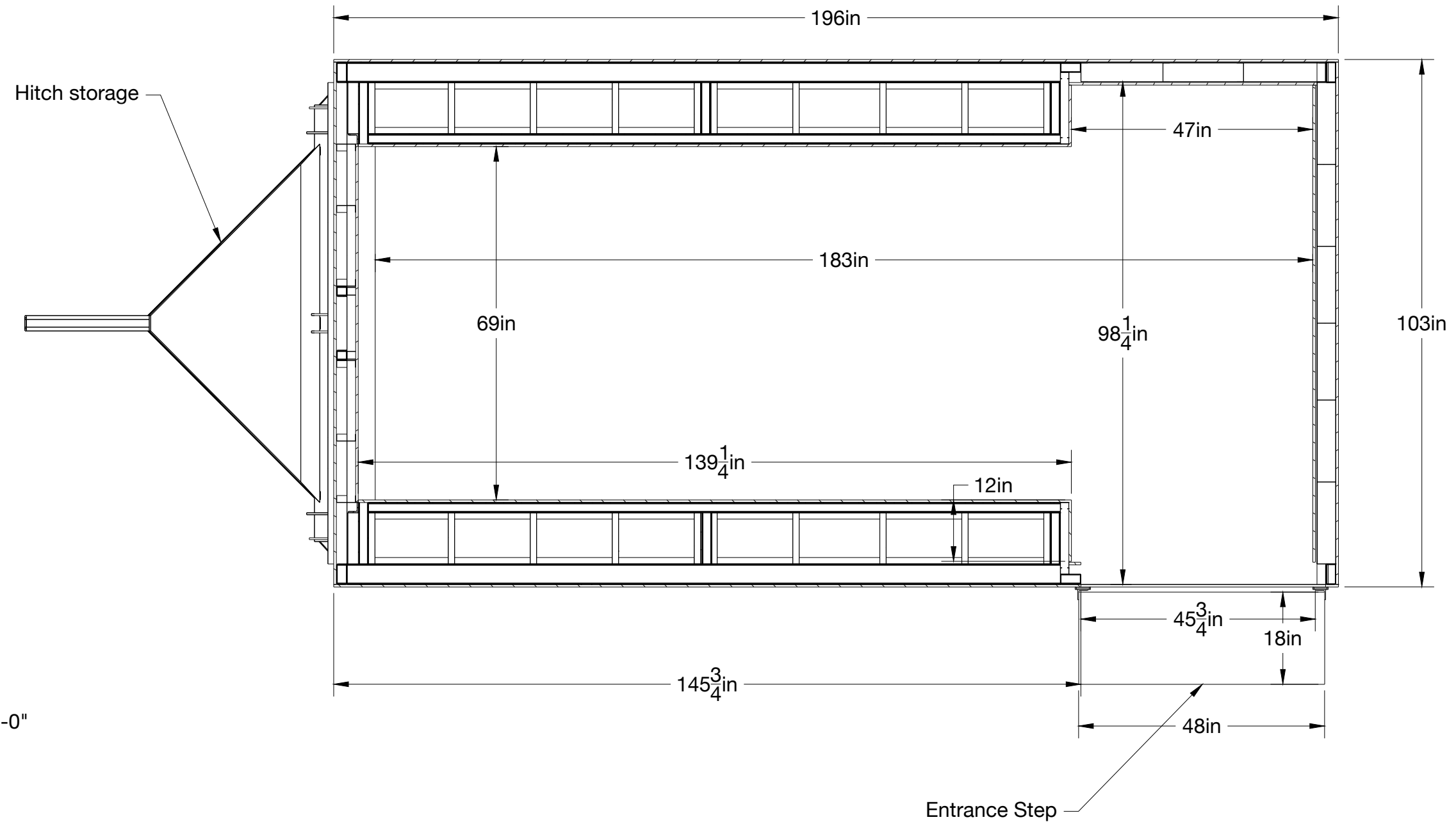
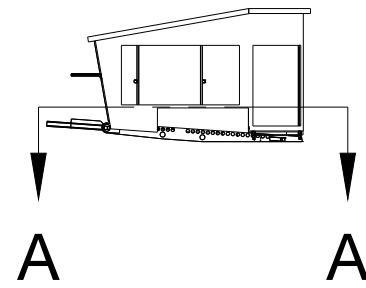
Encl.

Notes:

Scale 1/16" = 1'-0"

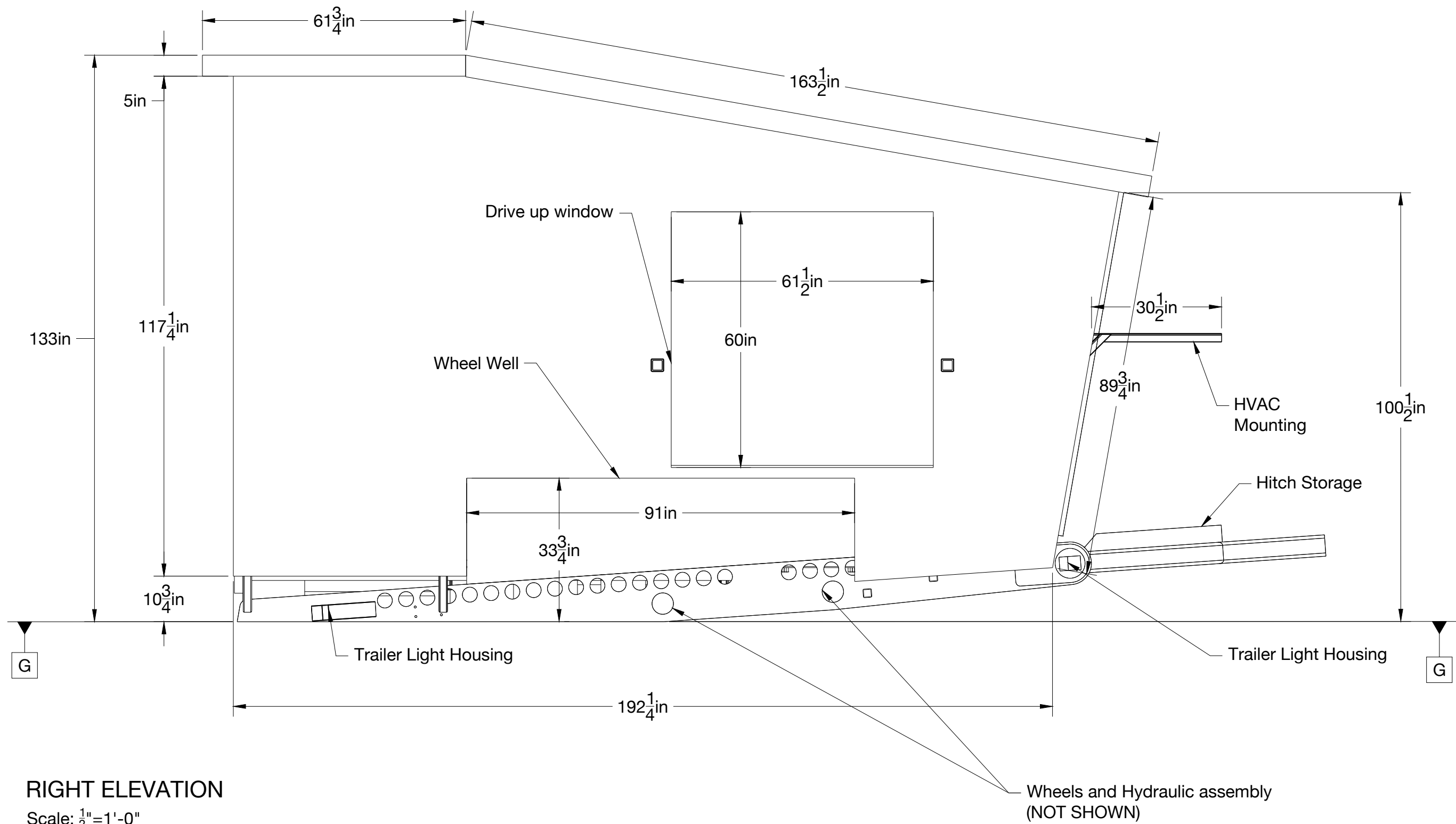
Structural Design

S101



PLAN

Scale: 1/2" = 1'-0"

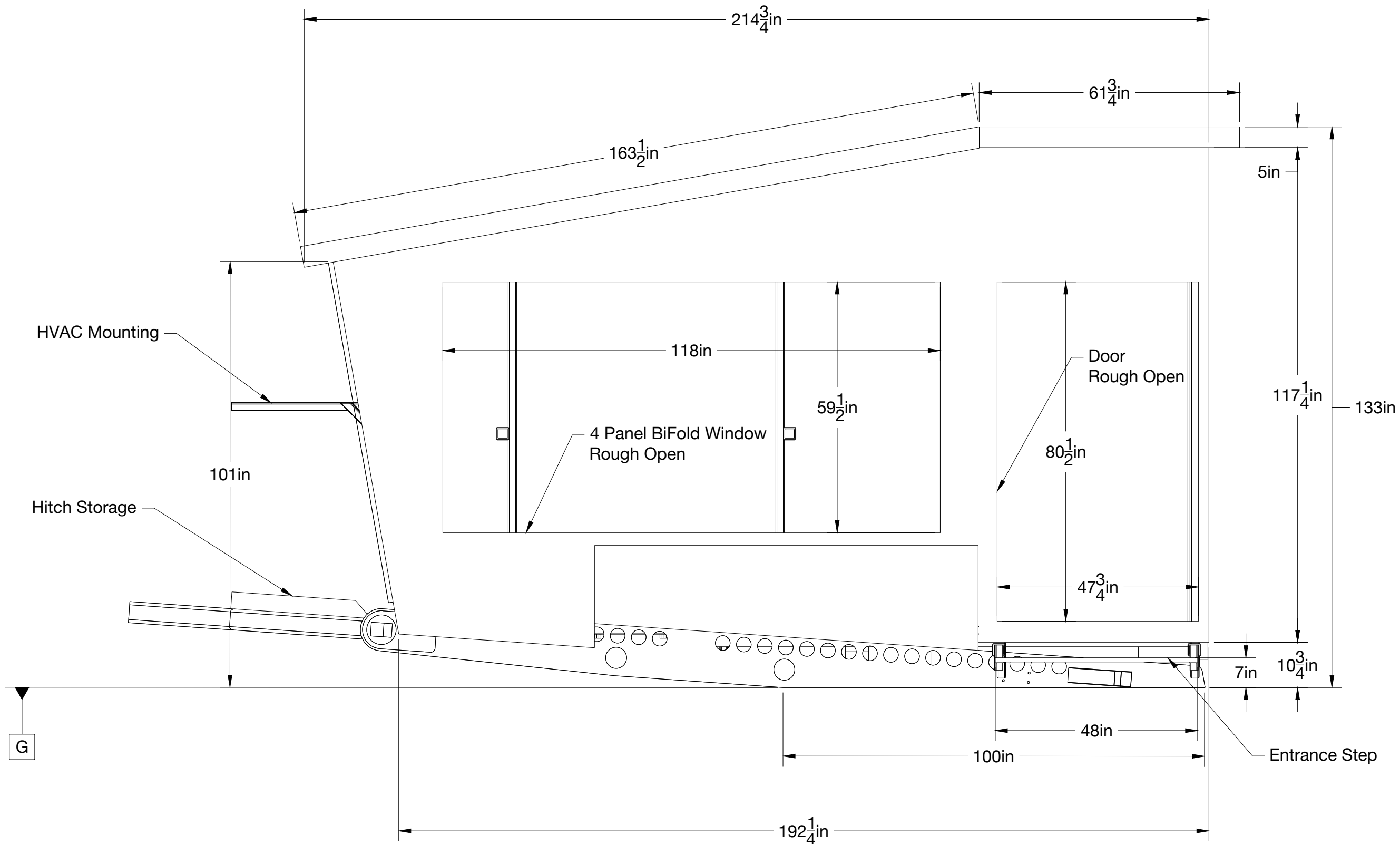


Notes:

Scale $\frac{1}{2}" = 1'-0"$

Structural Design

S201



LEFT ELEVATION

Scale: $\frac{1}{2}$ " = 1'-0"

flexetail

DHL Mobile

Notes:

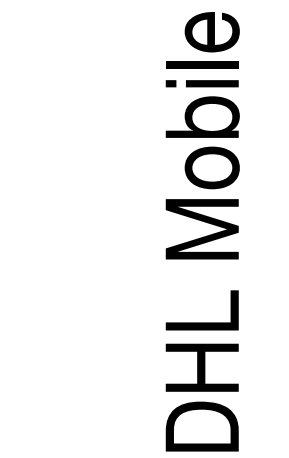
Scale $\frac{1}{2}$ " = 1'-0"

Structural Design

S202

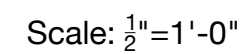
Drawn By
Nº

Aidan Symms
© 2020 Flexetail LLC



S203

Drawn By Aidan Syms
No. © 2020 Flexetail LLC





CERTIFICATE OF REGISTRATION

M.G.L. Chapter 90 Section 24B makes it a crime to alter this Certificate
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

INTERNAL CODE TRN		REGISTRATION TYPE Trailer		PLATE NUMBER E33682		EFFECTIVE DATE 26-Dec-2019		TITLE NUMBER		EXPIRES ON 30-Nov-2020	
MODEL YEAR 2017	MAKE LIFT	MODEL UTILIT	MODEL NUMBER	BODY STYLE TRAIL	COLOR BLACK		VEHICLE IDENTIFICATION NUMBER 1LPTD1627HKFEB035				
RESIDENTIAL ADDRESS (IF DIFFERENT THAN MAILING)							TOTAL REGISTERED WEIGHT FOR A COMMERCIAL VEHICLE OR TRAILER 14000				
GARAGE ADDRESS 74 PARK ST NEWTON MA 02458-2315							US DOT NUMBER FOR COMMERCIAL VEHICLE				
NAME(S) OF OWNER(S) AND MAILING ADDRESS FLEXETAIL LLC 74 PARK ST NEWTON MA 02458-2315							INSURANCE COMPANY Ohio Security Insurance Company				
							MAXIMUM SEATING CAPACITY FOR VEHICLES FOR HIRE				
LESSEE/IN CUSTODY OF							<i>James J. Jelen</i> Registrar of Motor Vehicles				
SPECIAL MESSAGE If this vehicle is newly acquired, it must be inspected within 7 days of registration.							CHANGE OF ADDRESS				
							<input type="checkbox"/> RESIDENTIAL <input type="checkbox"/> MAILING <input type="checkbox"/> GARAGE				

Important information for vehicle owners

- Certificate of Registration: Every person operating a motor vehicle shall have the Certificate of Registration for the motor vehicle and/or trailer, in the vehicle, in some easily accessible place. The records of the RMV constitute the official status of the vehicle registration.

Trailer Registration

TRAILER BILL OF SALE

SELLER: The Advance Metalworking Company, Inc.
3726 U.S. Highway 34
Kewanee, Illinois 61443

BUYER: Name: Kamm Design
Address: 274 Park Street
City: Newton State: MA Zip: 02458

DESCRIPTION OF TRAILER BEING SOLD:

YEAR: 2017 MAKE: Lifetime Lo Riser
COLOR: Black MODEL: IPT4-516
DESCRIPTION: Hydraulic inclining platform trailer.

VIN: 1LPTD1627HKFEB035

PAYMENT:

SELLER certifies to BUYER that the SELLER has the authority to sell this trailer and transfer the title to the BUYER. The SELLER further certifies that the title is free of liens. SELLER acknowledges receiving the following payment from the BUYER to transfer ownership of this trailer.

SELLING PRICE OF TRAILER: \$ **USD**

SELLER certifies that to the best of their knowledge, all information on this BILL OF SALE is correct. The SELLER has received payment from the BUYER and hereby transfers ownership of this trailer to the BUYER.

Annette K. Kull
Signature of SELLER

Sec/Treas
Office or Title

9/14/17
Date

SEAL

State of Illinois
County of Henry

This instrument was acknowledged before me on (date) 9/14/17

By ANNETTE K. KULL

SEAL



Sue M. Gruszeczek
Notary Public