1. MANUFACTURE
   a) NAME -- UNITED CONCRETE PRODUCTS, INC.
   b) ADDRESS -- 173 CHURCH STREET , YALESVILLE, CT 06492
   c) PHONE -- 1-203-269-3119

2. THIRD PARTY INSPECTION AGENCY
   a) NAME -- T.R. ARNOLD & ASSOCIATES, INC.

3. INDEX OF DRAWINGS AND PERTINENT INFORMATION SHEET

SHEET DESIGNATION	DESCRIPTION	DWG. DATE	REV. DATE
C-1	COVER SHEET	8/9/16	*
DP-1	DATA PLATE	8/9/16	*
S-1	FLOOR PLAN & ELEVATIONS	4/5/16	8/2/16
EL-1	ELECTRICAL POWER DISTRIBUTION	7/7/16	7/28/16
PD-1	BUILDING - PRODUCTION	4/29/16	8/2/16
1 THRU 16	CALCULATIONS	8/8/16	*
1 THRU 18	COMCHECK	7/6/16	*

NUMBER OF SHEETS IN EACH SET -- 39
SHEETS NOT REVISED AT THIS TIME -- 39

4. BUILDING INFORMATION
   a) PROJECT NAME -- UNITIL
   b) MODEL IDENTIFICATION -- 9277 M1012 - DAC BUILDING
   c) PROPOSED LOCATION ADDRESS -- PORTLAND, ME
   d) USE GROUP CLASSIFICATION -- U
   e) CONSTRUCTION TYPE CLASSIFICATION -- IIB
   f) SQUARE FOOT AREA OF BUILDING -- 120 S.F.
   g) AMOUNT OF ENCLOSED SPACE (VOLUME - CUBIC FEET) -- 1195 C.F.
   h) HEIGHT OF BUILDING ABOVE GRADE
      1. NUMBER OF STORIES -- 1
      2. NUMBER OF FEET -- 9'-11 1/2"
   i) DESIGN OCCUPANCY LOAD -- NO PERMANENT OCCUPANT, UTILITY
   j) SPECIAL SYSTEMS BY TYPE
      1. NONE
   k) BUILDING DESIGN LIVE LOADS
      1. SIDEWALLS -- WIND LOAD 99 MPH, EXPOSURE CATAGORY C
      2. ROOF -- LIVE LOAD 20 PSF
      3. FLOOR -- LIVE LOAD 80 PSF
      9. SNOW LOAD -- 80 PSF
      4. CORRIDOR -- N/A
      5. STAIRS -- N/A
      6. BALCONIES -- N/A
      7. OTHER -- N/A
      8. SEISMIC CATEGORY GROUP C
      10. FOUNDATION DISCLAIMER -- FOUNDATION IS THE RESPONSIBILITY OF THE SITE ENGINEER
      11. MINIMUM SOIL BEARING -- 2000 PSF
      12. BUILDING CONCRETE PSI @ 28 DAYS -- 5,000 PSI
      13. CONCRETE TYPE -- SILICEOUS AGGREGATE CONCRETE.

l) BUILDING CODES
   2010 MAINE UNIFORM BUILDING CODE WITH STATE AMENDMENTS
   2015 INTERNATIONAL BUILDING CODE WITH STATE AMENDMENTS
   2014 NATIONAL ELECTRICAL CODE WITH STATE AMENDMENTS
   2015 INTERNATIONAL MECHANICAL CODE WITH STATE AMENDMENTS
   2015 MAINE UNIFORM ENERGY CONSERVATION CODE WITH STATE AMENDMENTS

5. HVAC SYSTEMS
   a) WALL MOUNTED ELECTRIC A/C UNIT WITH HEATER (5.0 KW HEATING / 24,000 BTUH COOLING).

6. EXTERIOR ENVELOPE THERMAL PERFORMANCE
   a) NONE

7. INTERIOR ENVELOPE THERMAL PERFORMANCE
   a) WALLS AND CEILING HAVE (1) LAYER OF 2" INSULATION (R-13.1)
      W/F.R.P. COLOR: WHITE, ON 1/2" PLYWOOD

8. PLUMBING
   a) NONE

9. ELECTRICAL
   a) SEE ELECTRICAL DRAWING EL-1

10. UNITED CONCRETE ENGINEERS STRUCTURAL DESIGN

11. DATA PLATE AND LABELS -- LOCATED ON INSIDE PANEL DOOR.

12. GENERAL NOTES:
   a) BUILDING SETBACK OVER 10' FROM ALL SIDES TO PROPERTY LINE OR MID POINT BETWEEN TWO BUILDINGS ON THE SAME PROPERTY.
   b) BUILDING ACCESSIBILITY BY OTHERS IN THE FIELD IF REQUIRED.
   c) BUILDING NOT TO BE LOCATED IN A FLOOD PLAIN.

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1001 Oldtown, ME 04472
State(s) MAINE
This document is certified as being in conformance
With LISTED CODES
August 31, 2016
Approved By
Approval of this document does not authorize or approve any omissions or deviations from the approved construction documents or applicable State Laws.
TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

DRAWING LOG		
NUMBER	DATE	DESCRIPTION
3		
2		
1		

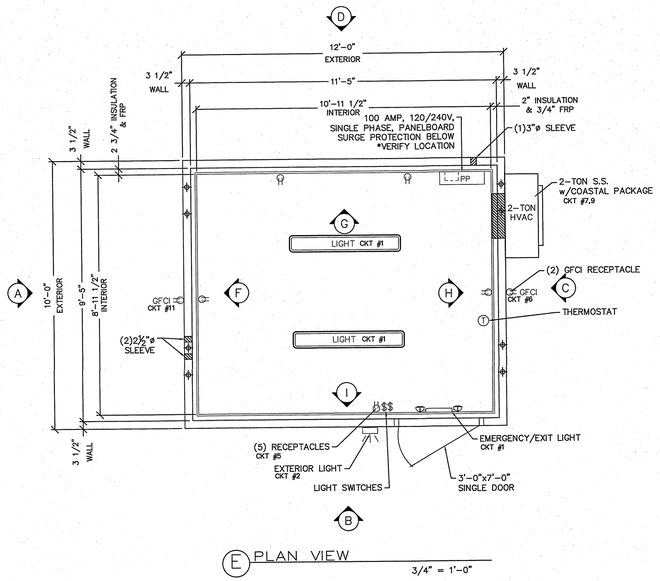
UNITED CONCRETE PRODUCTS

UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	UNITIL
JOB NAME:	UNITL DAC BUILDING, W. COMMERCIAL ST.
JOB LOCATION:	PORTLAND, ME
DWG TITLE:	COVER SHEET

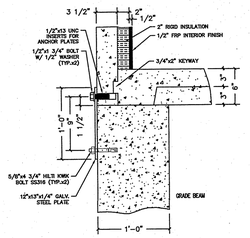
Kevin M. Finn, P.E., Inc.
Jeffrey R. Walton Jr., P.E.
1716 Elkhart Rd., Suite 1
Goshen, IN 46526
ME PE Lic. #12871

CAD DWN: JPR	DATE: 8/9/16	PM CK'D:	DATE:
CAD CK'D:	DATE:	GM CK'D:	DATE:
JOB NO: 9277	SCALE NONE	DRAWING NO:	C-1



E PLAN VIEW

3/4" = 1'-0"



TYPICAL BUILDING PINNING DETAIL
(N.T.S.)

GENERAL NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI @ 28 DAYS.

2. STRUCTURAL SHALL BE WET CAST USING A SELF COMPACTING CONCRETE MIX.

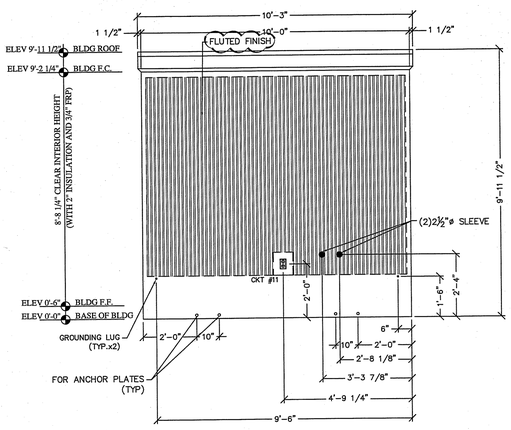
3. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A706, GRADE 60, 1½" MINIMUM COVER, U.N.O.

4. THE SUPPORTING BASE FOR THE BUILDING AND ALL CONCRETE PADS OUTSIDE OF THE BUILDING ARE THE RESPONSIBILITY OF THE SITE CONTRACTOR.

5. CONCRETE STRUCTURE TO HAVE 3" SOLID WALLS w/ ¼" FLUTES, 6" THICK FLOOR AND 6" THICK ROOF.

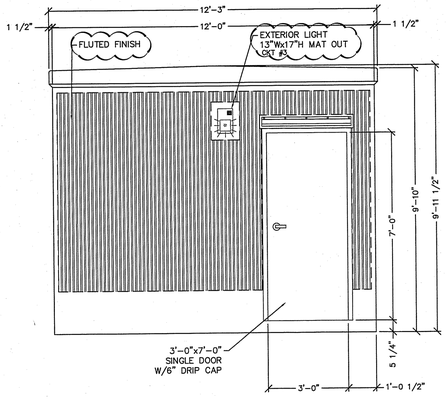
FINISH SCHEDULE

AREA	COATING TYPE	COLOR
BUILDING EXTERIOR ROOF	(2) COATS OF ROOF MASTIC	WHITE
BUILDING EXTERIOR WALLS	(1) COAT OF THOROSEAL AND FLUTED FINISH	PER OWNER'S SPECIFICATIONS
BUILDING INTERIOR WALLS, CEILING	NUDO F.R.P. ON ¾" PLYWOOD & (1) LAYER OF 2" INSULATION WITH COVE BASE	WHITE
BUILDING INTERIOR FLOOR	NON-SKID EPOXY	GRAY
BUILDING DOORS & FRAMES	(2) COATS OF SHERWIN WILIAMS SHER-CRYL HPA	PER OWNER'S SPECIFICATIONS
BUILDING LOUVERS	MILL FINISH	MILL FINISH
CONSTRUCTION SEALANT	TREMCO DYMONIC CAULKING	LIMESTONE



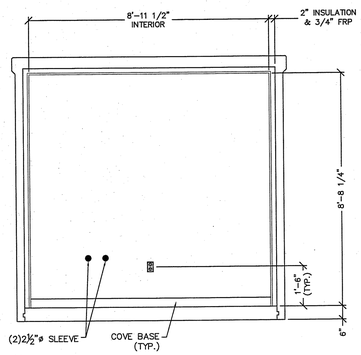
A EXTERIOR ELEVATION

1/2" = 1'-0"



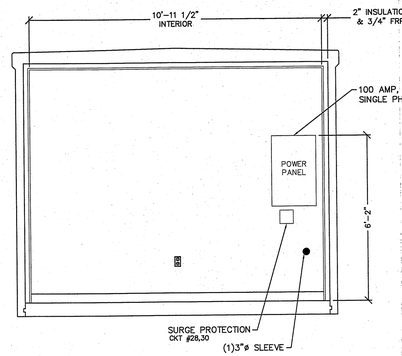
B EXTERIOR ELEVATION

1/2" = 1'-0"



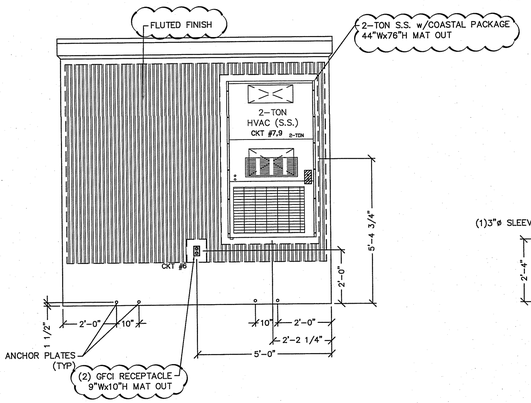
F INTERIOR ELEVATION

1/2" = 1'-0"



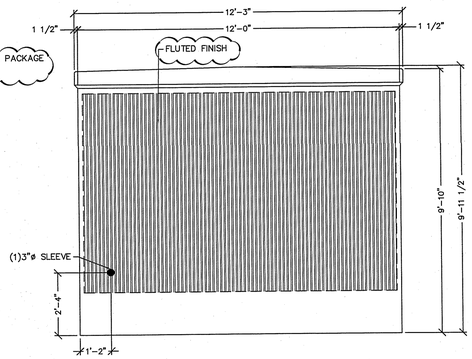
G INTERIOR ELEVATION

1/2" = 1'-0"



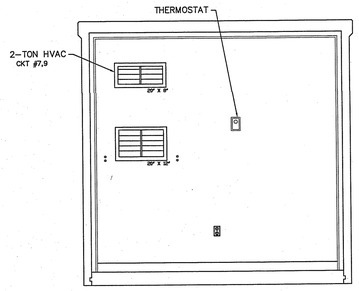
C EXTERIOR ELEVATION

1/2" = 1'-0"



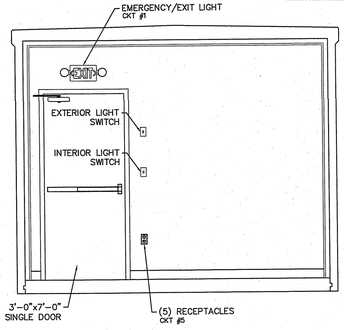
D EXTERIOR ELEVATION

1/2" = 1'-0"



H INTERIOR ELEVATION

1/2" = 1'-0"



I INTERIOR ELEVATION

1/2" = 1'-0"

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1001 Orham, IN 46112
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By _____
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Waitton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

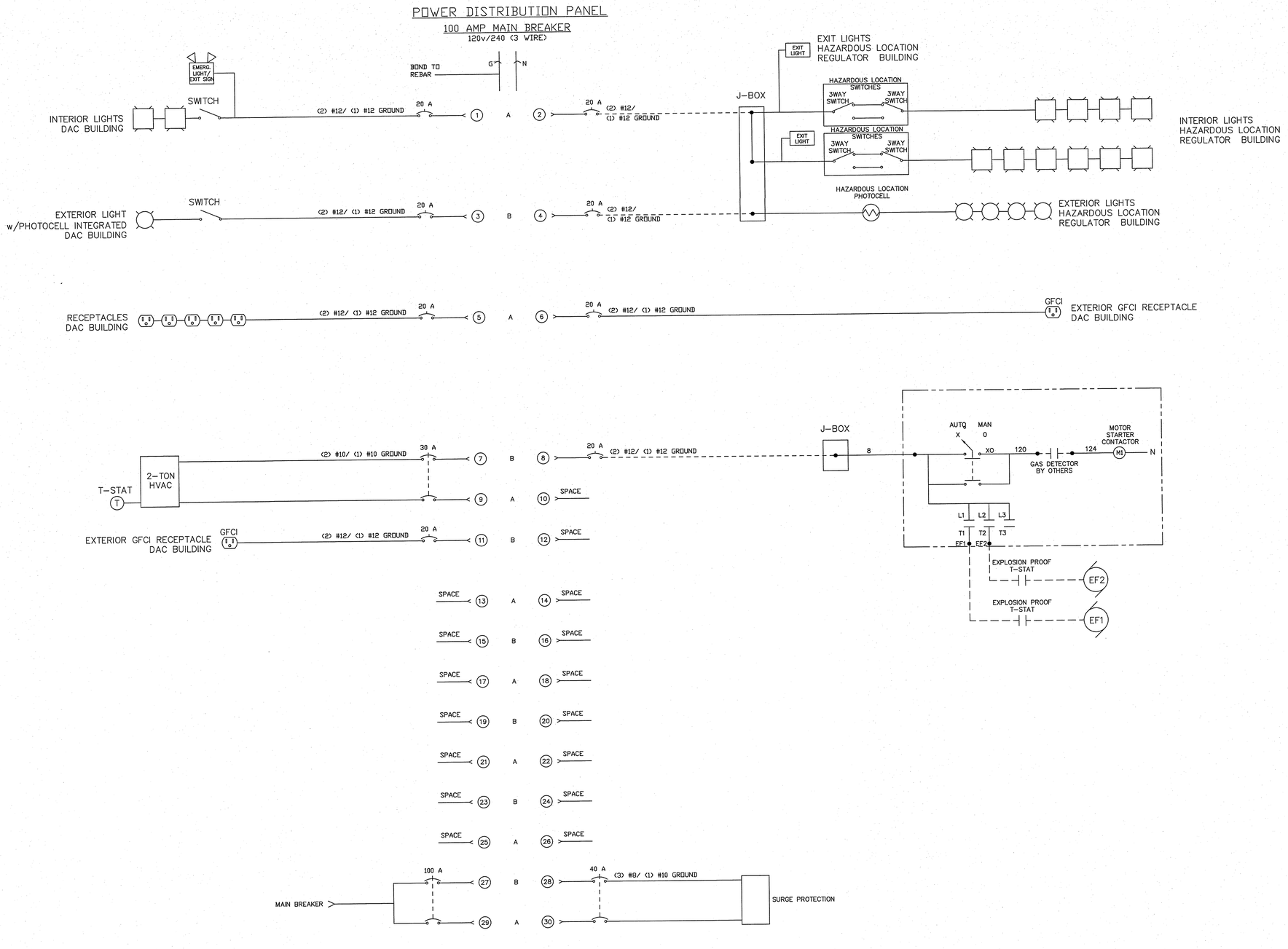
AUG 29 2016

ISSUE LOG		
NUMBER	DATE	DESCRIPTION
4		
3	8/2/16	REVISED AS CLOUDED
2	7/29/16	REVISED AS CLOUDED
1	4/29/16	REVISED EXTERIOR FINISH

UNITED CONCRETE PRODUCTS

UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	UNITIL		
JOB NAME:	UNITIL DAC BUILDING, W. COMMERCIAL ST.		
JOB LOCATION:	PORTLAND, ME		
DWG TITLE:	DAC BUILDING		
DRAFTER: JPR	DATE: 4/5/16	CK BY:	DATE:
JOB NO: 9277	SCALE 3/8" = 1'-0"	DRAWING NO: S-1	



NOTES:
1. ALL CONDUIT IN RTU ROOM SHALL BE 3/4" EMT OR LARGER WITH STAMPE STEEL BOX AND COMPRESSION FITTINGS.
2. ELECTRICAL WIRE INSULATION IS THHN / THWN.
3. ALL THE WIRE IN THE REGULATOR BUILDING WILL BE RIGID METAL CONDUIT WITH CLASS 1 DIV. 1 CONDUIT FITTINGS 4 BOXES.

240v 1 PHASE 3-WIRE LIGHTING / POWER PANEL

ELECTRICAL LOADS				
CIRCUIT #	AMP RATING	DESCRIPTION	"A" LOAD (WATTS)	"B" LOAD (WATTS)
1	20	INTERIOR LIGHTS DAC BUILDING	500	–
2	20	INTERIOR LIGHT REGULATOR BUILDING	500	–
3	20	EXTERIOR LIGHT DAC BUILDING	–	21
4	20	EXTERIOR LIGHT REGULATOR BUILDING	–	320
5	20	INTERIOR RECEPTACLE DAC BUILDING	900	–
6	20	EXTERIOR GFCI RECEPTACLE DAC BUILDING	180	–
7	20	HVAC DAC BUILDING	–	2500
9			2500	–
8	20	EXHAUST FAN REGULATOR BUILDING	–	1584
10	–	SPACE	–	–
11	20	EXTERIOR GFCI RECEPTACLE DAC BUILDING	180	–
12	–	SPACE	–	–
13	–	SPACE	–	–
14	–	SPACE	–	–
15	–	SPACE	–	–
16	–	SPACE	–	–
17	–	SPACE	–	–
18	–	SPACE	–	–
19	–	SPACE	–	–
20	–	SPACE	–	–
21	–	SPACE	–	–
22	–	SPACE	–	–
23	–	SPACE	–	–
24	–	SPACE	–	–
25	–	SPACE	–	–
26	–	SPACE	–	–
27	100	MAIN BREAKER	–	0
29			0	–
28	40	SURGE PROTECTION	–	0
30			0	–
			4580 WATTS 38 AMPS	4425 WATTS 37 AMPS
TOTAL			9005 WATTS 38 AMPS	

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1001 Orham, ME 04373
Stamped _____ MAINE
Department of Professional and Financial Regulation
This document is certified as being in conformance
With _____ LISTED CODES

August 31, 2016
Approved By _____
Approval of this drawing is for conformance with the codes listed only. Any omissions or deviations from the applicable codes or ordinances of applicable State Laws.
DRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

ISSUE LOG		
REV. NO	DATE	DESCRIPTION
4		
3	7/28/16	REVISED PER WW
2	05/04/16	RECORD DRAWING
1	11/6/15	REVISED INTERIOR LIGHTS

UNITED CONCRETE PRODUCTS

UNITED CONCRETE PRODUCTS INC.
173 Church Street Yalesville, CT 06492
(800) 234-3119 Fax: (203) 265-4941

CUSTOMER:	UNITIL
JOB NAME:	UNITIL DAC BUILDING, W. COMMERCIAL ST.
JOB LOCATION:	PORTLAND, ME
DWG TITLE:	ELECTRICAL POWER DISTRIBUTION
DRAFTER: JPR	DATE: 7/7/16
CK BY: WW	DATE: .
JOB NO: 9277	SCALE: NONE
DRAWING NO:	EL-1

Maine (Commercial Modular) DP-1

MANUFACTURER'S DATA PLATE

Manufacturer: United Concrete Products
Address: 173 Church Street
City, State, Zip: Yalesville, CT 06492

LISTED INDUSTRIALIZED BUILDING

Model	M1012				
Occupancy Classification	U	Const. Class	VB		
Manufacturer's Serial No(s).	9277				
Date of Manufacture		Plan Approval No.			
Date Data Plate Attached					
Permissible Gas Type(s)	N/A				
Electric Rating	100 Amp, 120/240V, Single Phase				
Test Voltage/Time	500V/60 Sec.				
Water Supply: Test Procedure	N/A				
Floor Design Live Load	80 PSF	Design Wind Speed And Exposure	99 MPH, C		
Ground Snow Load	80 PSF	Roof Design Live Load	20 PSF		
Exterior Wall Fire Rating	N/A	Seismic Design Category	C		
Winter Design Temp.: Inside	+70 F	Outside	-3 F		
U_0: Ceiling	.072	Wall	.069	Floor	N/A

FACTORY INSTALLED EQUIPMENT

EQUIPMENT	MANUFACTURER	MODEL NO.
Heating	Marvair	AVPA24ACA050N-A5-500VAR
Cooling		
Range/Burner		
Oven		
Refrigerator		
Water Heater		
Dish Washer		
Disposal		
Hydro-Massage Tub		
Special Conditions		
Shipping Weight(s)	33,000LBS	
TRA Label No(s).		
State Insignia No(s).		

Follow precisely all instructions with this building. Foundations, Installation and Utility Connections are subject to inspection by local authorities.

CODE REFERENCE PLATE

THIS MANUFACTURED STRUCTURE HAS BEEN CONSTRUCTED IN CONFORMANCE WITH THE FOLLOWING CODES:

☑	2014*	NATIONAL ELECTRICAL CODE®
☑	2015*	INTERNATIONAL BUILDING CODE
☑	2015*	INTERNATIONAL MECHANICAL CODE
☐		INTERNATIONAL PLUMBING CODE
☑	2015*	INTERNATIONAL ENERGY CONSERVATION CODE
☐		INTERNATIONAL RESIDENTIAL CODE
☐		INTERNATIONAL FUEL GAS CODE
☐		INTERNATIONAL FIRE CODE
☐		UNIFORM BUILDING CODE
☐	2009*	UNIFORM PLUMBING CODE
☐		UNIFORM MECHANICAL CODE
☐		NATIONAL STANDARD PLUMBING CODE
☑	Maine Uniform Building & Energy Code	
☐	Maine State Plumbring Code	
☑	2009 NFPA-1 Fire Code	
☐	2008 NFPA-30 Flammable and Combustible Liquids Code	
☐		
☐		
☐		
☐		
☐		
☑	*=with State Amendments	

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1001 Hiland, PA 16151
State(s): MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With: LISTED CODES

August 31, 2016

Approved By: Joshua Dilen
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

Design Calculations

For:

Precast Utility Building

Regulator Station

16077

Portland, ME

Submitted on:

8/8/2016 *REV-00*

REV-01

United Concrete Products, Inc.

173 Church Street

Yalesville, CT 06492

(800) 234.3119

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515

State(s) MAINE

Accredited Evaluation and Inspection Agency

This document is certified as being in conformance

With LISTED CODES

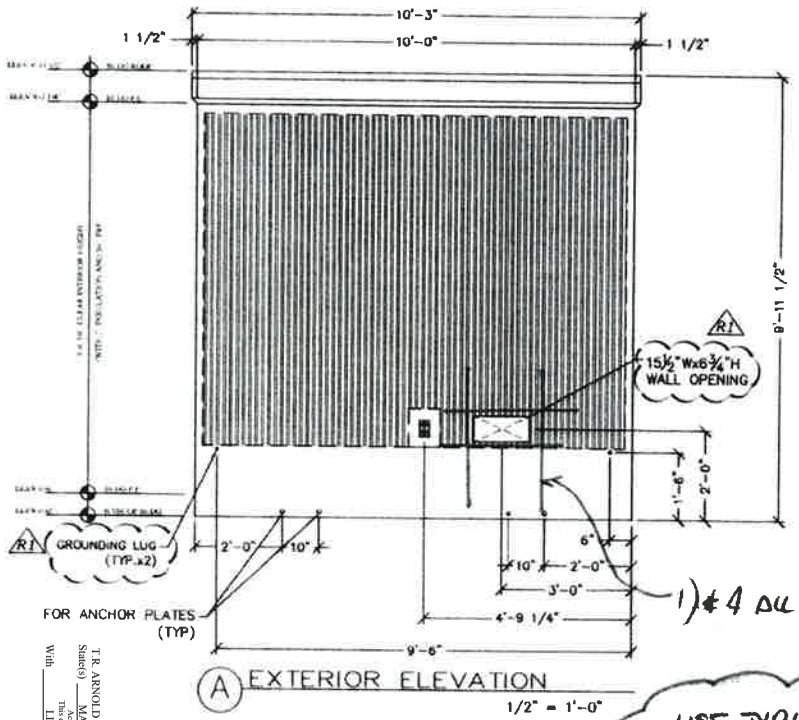
August 31, 2016

Approved By Joshua Dilts

Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.

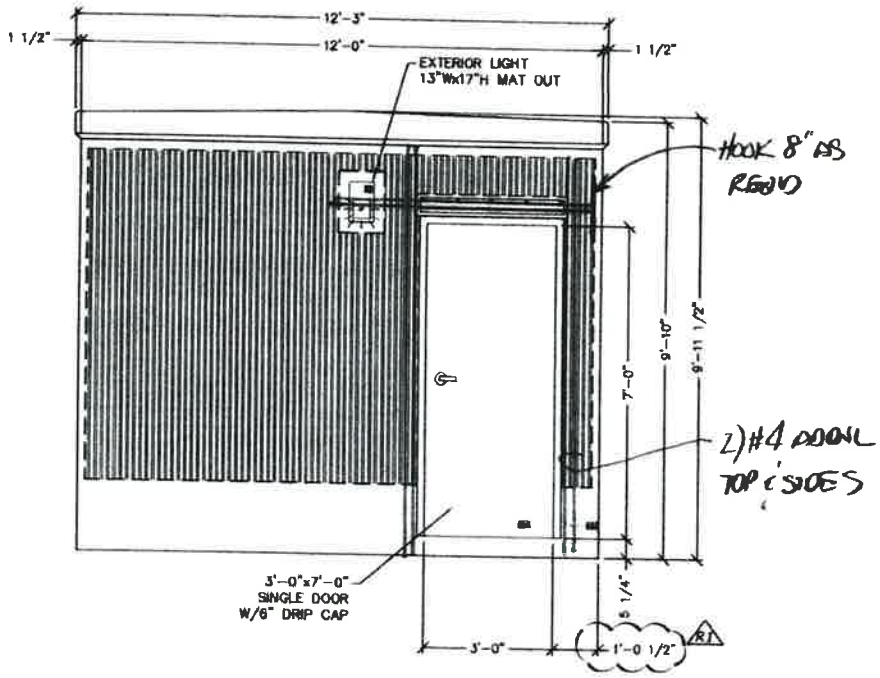
TRA APPROVAL LIMITED TO

FACTORY-BUILT MODULES ONLY



A EXTERIOR ELEVATION

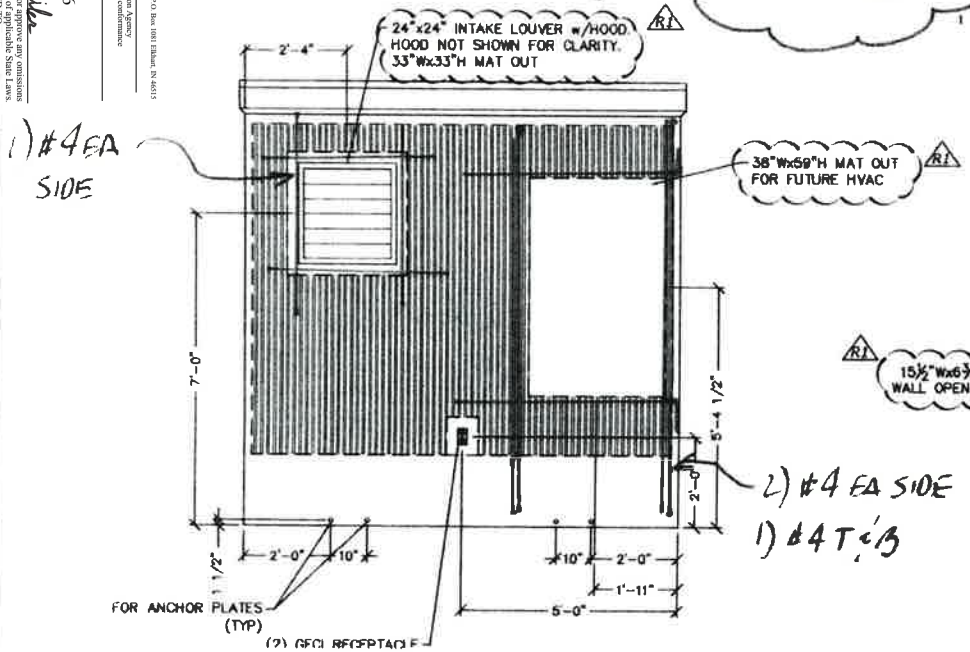
1/2" = 1'-0"

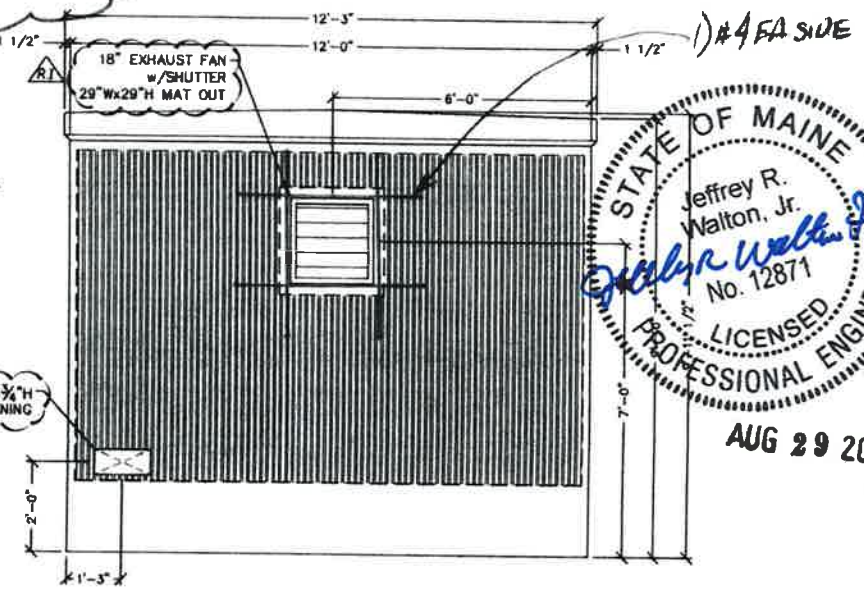


B EXTERIOR ELEVATION

1/2" = 1'-0"

USE TYPICAL MOLD-TECH REINF w/ ADDN'L #4's AS SHOWN





STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016

August 31, 2016

Approved By: _____

Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.

TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1001 Elkhart, IN 46515

State(s) MAINE

This document is certified as being in conformance with LISTED CODES

This document is certified by a Evaluation and Inspection Agency

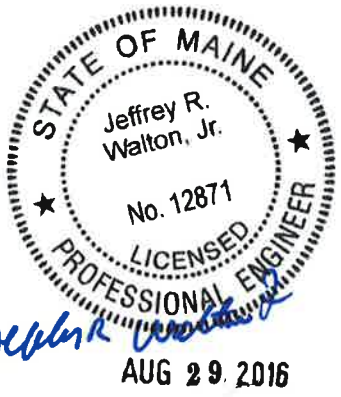
General Information

Applicable Codes:

1.) ACI 318-08 Building Code Requirements for Structural Concrete (318-08) and commentary (318R-08)
2.) AISC Manual of Steel Construction, 14th Editions (ASD & LRFD)
3.) MNL 120-10 PCI Design Handbook, 7th Edition
4.) International Building Code 2009 with Amendments
5.) SEI/ASCE 7-05 Minimum Design Loads for Building and other Structures
6.) 2010 Maine Uniform Building and Energy Code

Material Specifications:

1.)	Precast Concrete.....	f'_{ci} = 2500 psi
		$f'_{c,28}$ = 5000 psi
	(Normal weight concrete)	w = 150 pcf
2.)	Prestressed/Post-Tensioned Concrete	f'_{ci} = 2500 psi
		$f'_{c,28}$ = 5000 psi
3.)	Mild reinforcement (ASTM A615).....	f_y = 60 ksi
4.)	Prestressed Reinforcement (ASTM A417 7-wire low lax).....	f_y = 270 ksi
5.)	Steel Plates and Angles (ASTM A36).....	f_y = 36 ksi
6.)	Hollow steel sections (ASTM A500).....	f_y = 46 ksi
7.)	Bolts (ASTM A325).....	ϕf_v (N)= 36 ksi
		ϕf_v (X)= 45 ksi
8.)	Threaded rod (ASTM A307).....	ϕf_v = 18 ksi
9.)	Headed anchor studs (ASTM A108).....	f_y = 50 ksi
10.)	Welded wire fabric (ASTM A185 plain WWR).....	f_y = 80 ksi
11.)	Allowabl soil bearing capacity.....	F_{brg} = 3000 psf



T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Wind Loading

User Input:

Wind importance factor =	1.15	
Exposure Category =	C	
Basic wind speed, V =	99 mph	
Topographic Factor, K_{zt} =	1.0	(Section 6.5.7)
Wind Directionality Factor, K_d =	0.85	(Table 6-4)
Gust Effect Factor, G =	0.85	(Section 6.5.8)
Windward Ext Press Coeff, C_{pw} =	0.8	(Figure 6-6)
Leeward Ext Press Coeff, C_{pL} =	-0.5	
Internal Pressure Coefficient, GC_{pi} =	-0.18	(Figure 6-5)

Calculated values:

Velocity Pressure Coefficient at "z", K_z =	0.85	
Velocity Pressure at "z", q_z =	20.8 psf	
Windward design Pressure, p_w =	17.9 psf	
Leeward design Pressure, p_L =	-12.6 psf	
MWFRS pressure =	30.5 psf	(Case #1 Fig 6-9)

Wind overturning moments:

	$V_{u\ (k)}$	$M_{u\ (k\text{-}ft)}$
X-axis =	5.84	29.09
Y-axis =	4.87	24.24

Seismic Loading (per Simplified Alternative Structural Design Criteria)

User Input:

Seismic category =	C	
Seismic importance factor =	1.25	
Occupancy Category =	III	
Short period response, S_s =	0.314	
1 second period response, S_1 =	0.077	
Seismic site class =	D	(D to be used if soil not known)
F_a =	Per USGS maps	
F_v =	Per USGS maps	
R =	4	(4 for ordinary reinforced PC Brg walls)

Calculated values:

S_{MS} =	0.487	S_{DS} =	0.324
S_{M1} =	0.184	S_{D1} =	0.123
Seismic mass, W =	15.8 kips		
X&Y-axis Base Shear, V_u =	1.3 kips		
Seismic overturning moment:	6.4 k-ft	Wind controls X-axis design	
		Wind controls Y-axis design	

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

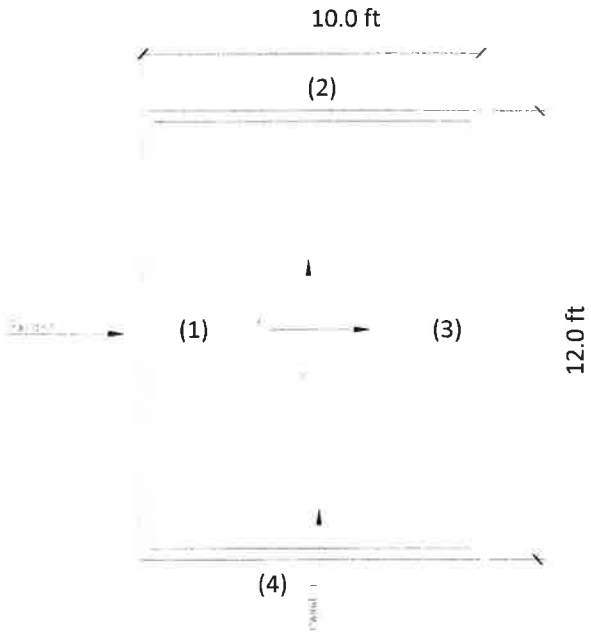
August 31, 2016

Approved By Joshua Siler

Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Geometry & Live Loads

Building width =	10.00	ft
Building length =	12.00	ft
Building height =	9.96	ft
Wall height =	9.13	ft
Roof overhang =	1.50	in
Roof Live Load =	20	psf
Roof Snow Load =	80	psf
Roof Super. DL =	0	psf
Floor Live Load =	80	psf
Floor Super. DL =	5	psf
Wall Lateral Load =	30.5	psf
Roof thickness$_{(ave)}$ =	5.00	in
Wall thickness =	3.5	in
Floor thickness$_{(ave)}$ =	6	in



Blockouts in roof =	0.00	sq-ft
Blockouts in walls:		
Wall (1) =	24.07	sq-ft
Wall (2) =	0.75	sq-ft
Wall (3) =	2.00	sq-ft
Wall (4) =	2.00	sq-ft
Component Wind Loads per wind worksheet:		
$P_{W(+)}$ =	18.10	psf
$P_{W(-)}$ =	-22.30	psf
Bldg on Foundation:	0	(1 = on foundation | 0 = brg on soil)
Blockouts in Floor =	0.00	sq-ft

Building Weight

* Conservatively ignore equipment for overturning

Roof =	7.85	kips
Wall (1) =	3.74	kips
Wall (2) =	3.73	kips
Wall (3) =	4.71	kips
Wall (4) =	3.67	kips
Floor =	9.00	kips
Addn'l DL =	0.00	kips (Interior Walls)
Total =	32.70	kips

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Diles

Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

Sliding (Using side with maximum exposure)

Coefficient of friction, C_f =	0.3	(assumed)
Sliding resistance =	9.8 kips	(0.3*building wt.)
Sliding force =	3.65 kips	(maximum wall area times wind force)
F.S. =	2.69	

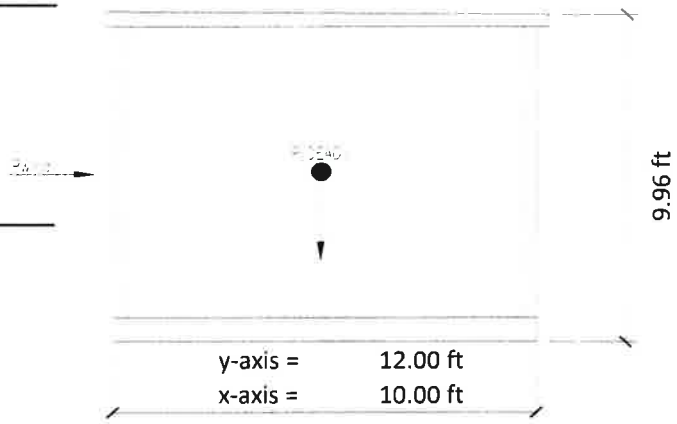
Overturning

F.S. against overturn about the x-axis:

M_{OT} =	15.1 kip-ft
M_{RES} =	196 kip-ft
F.S. =	12.9

F.S. against overturn about the y-axis:

M_{OT} =	18 kip-ft
M_{RES} =	159 kip-ft
F.S. =	8.7



Soil Bearing Stress (about y-axis which controls)

Per table 1806.2 Material Class 5, 2009 IBC

Full roof live + floor live + dead load

$Area_{roof}$ =	125.6 sq-ft	
$Area_{floor}$ =	120.0 sq-ft	
$P_{gravity}$ =	52341 #	
f_b =	436 psf	<------Less than allowable bearing ok!

Full floor live + dead load + wind + half roof

$P_{gravity}$ =	48574 #	
M_{OT} =	18178 #-ft	
S_{floor} =	200 ft^3	($bh^2/6$)
P/A =	405 psf	
M/S =	91 psf	
$f_{b\text{-}total}$ =	496 psf	<------Less than allowable bearing ok!

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Diller
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

Lateral wall loading and forces

Walls 2 & 4 (Non-Load Bearing)

(Roof connections)

Shear force at top of wall, V_u =	1.46 kips	
capacity of roof connections each, ϕV_n =	3.0 kips	(per calc sheet)
# of connections required =	2	(min of 2 per wall)

(Wall properties)

Wall length =	10.00 ft	
Area =	420.0 sq-in	
Axial Load =	3.595 kips	(ultimate weight of wall only)
S_{wall} =	8400 in^3	($bh^2/6$)

(Wall forces)

M_u =	13.3 k-ft	
T_u =	1.08 kips	(maximum compressive force at end)
T_u =	-0.36 kips	(maximum tension force at end, "+" = net compression)
ϕT_n =	10.8 kips	(Tension capacity w/ 1)#4 ea end of wall)

(Shear in concrete at base of wall)

* assume #4's @ 12" o.c. & μ = 1.4 for integrally cast) λ = 1

$\phi V_n = \phi A_{vf} F_y \mu \lambda$ = 126.0 kips

V_u = 1.46 kips <------ok!

(Wind Loading out of plane on wall)

	Unit Width (per 1 ft)	Entire Wall
P_{DL} =	0.30 kips	3.00 kips
P_{Lat} =	1.08 kips	10.79 kips
$P_{W(+)}$ =	18.1 psf	181.00 psf
$P_{W(-)}$ =	-22.3 psf	-223.00 psf

Note: center vertical reinforcement in wall ~ horizontal reinforcement should be on inside face.

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

Walls 1 & 3 (Load Bearing)

(Roof connections)

Shear force at top of wall, V_u =	1.22 kips	
capacity of roof connections each, ϕV_n =	3.0 kips	(per calc sheet)
# of connections required =	2	(min of 2)

(Wall properties)

Wall length =	12.00 ft	
Area =	504.0 sq-in	
Axial Load =	1.528 klf	(ultimate load of wall, roof and roof live load)
S_{wall} =	12096 in^3	($bh^2/6$)

(Wall forces)

M_u =	11.1 k-ft	
T_u =	1.08 kips	(maximum compressive force at end)
T_u =	0.23 kips	(maximum tension force at end, "+" = net compression)
ϕT_n =	10.8 kips	(Tension capacity w/ 1)#4 ea end of wall)

(Shear in concrete at base of wall)

* assume #4's @ 12" o.c. & μ = 1.4 for integrally cast)

$\phi V_n = \phi A_{vf} F_y \mu \lambda$ =	151.2 kips/ft	
V_u =	1.22 kips	<------ok!

(Wind Loading out of plane on wall plus gravity)

w/	(typical ft)	(entire)
P_{DL} =	0.73 kips	8.72 kips
P_{LL} =	0.41 kips	4.92 kips
P_{Lat} =	1.08 kips	12.94 kips
$P_{W(+)}$ =	18.1 psf	217.20 psf
$P_{W(-)}$ =	-22.3 psf	-267.60 psf

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016

Beam Above Door or Wall Opening — Load Bearing Wall

(Geometry and loads)

length =	40.3 in	opening width =	40.25 in
h =	23.4 in	opening height =	86.125 in
d =	21.4 in	Load bearing wall? =	1 (0 = no, 1 = yes)
b =	3.50 in		

W_u =	1.151 klf	(includes roof live load)
M_u =	1.619 k-ft	$M_u = W_u \ell^2/8$
V_u =	0.90 kips	$V_u = W_u (\ell\text{-}d)/2$

(Flexure)

Assuming 2) #4 standard above door: A_s = 0.40 sq-in

$a = A_sF_y/0.85f'_cb$ =	1.61 in	
$\phi M_n = \phi A_sF_y(d\text{-}a/2)$ =	446 k-in	
	37.1 k-ft	<------ok!
ρ =	0.0053	

(Shear)

$\phi V_n = \phi 2f'c^{1/2}b_wd\lambda/1000$ =	7.96 kips	
ϕV_n /2 =	3.98 kips	<------ok! No shear reinf req'd

Roof Design

(Geometry and loads)

length =	116.5 in
h =	5.00 in
$d_{average}$ =	4.00 in
b =	12 in

W_u =	0.203 klf/ft
M_u =	2.392 k-ft/ft
V_u =	1.90 klf

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Dike
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

(Flexure)

2x6-D7xD5 WWF (1 layers) A_s = 0.42 sq-in

$a = A_sF_y/0.85f'_cb$ =	0.66 in	
$\phi M_n = \phi A_sF_y(d\text{-}a/2)$ =	111 k-in	
	9.25 k-ft	<------ok!
ρ =	0.0088	<------ok!
ρ_{min} =	0.0035	
ρ_{max} =	0.025	
ρ_{bal} =	0.034	β_1 = 0.80

(Shear)

$\phi V_n = \phi 2f'c^{1/2}b_wd\lambda/1000$ =	5.09 kips	<------ok! No shear reinf req'd

Floor Slab Design

(Geometry and loads)

length = 116.50 in
h = 6 in
d = 3 in
b = 12 in

W_u = 0.397 klf/ft (Soil Pressure)
M_u = 4.677 k-ft/ft
V_u = 1.88 klf

(Flexure)

2x6-D7xD5 WWF (1 layers) A_s = 0.42 sq-in (Top Reinf)

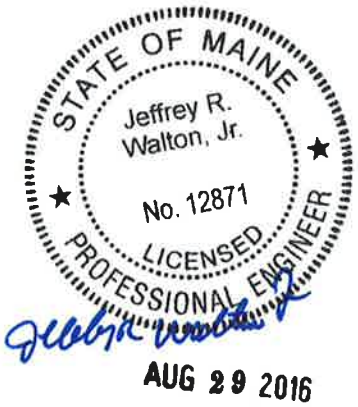
$a = A_sF_y/0.85f'_cb$ = 0.49 in
$\phi M_n = \phi A_sF_y(d-a/2)$ = 62.4 k-in
5.20 k-ft <------ok!
ρ = 0.0117 <------ok!
ρ_{min} = 0.0035
ρ_{max} = 0.025
ρ_{bal} = 0.034 β_1 = 0.80

(Shear)

$\phi V_n = \phi 2f'c^{1/2}b_wd\lambda/1000$ = 3.82 kips <------ok! No shear reinf req'd

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY



AUG 29 2016

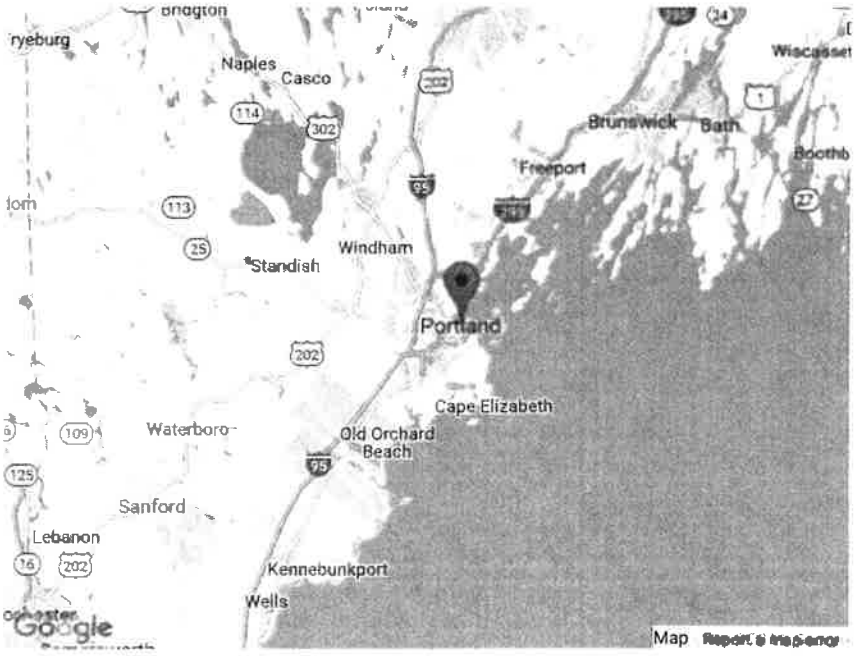
Search Results

Query Date: Mon Aug 08 2016
Latitude: 43.6615
Longitude: -70.2553

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 107
Risk Category II: 118
Risk Category III-IV: 127
MRI 10-Year:** 76
MRI 25-Year:** 86
MRI 50-Year:** 91
MRI 100-Year:** 97

ASCE 7-05 Windspeed:
99 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
83 (fastest mile in mph)



*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Dike
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Print your results

WINDSPEED WEBSITE DISCLAIMER

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the windspeed report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the windspeed report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the windspeed load report.

USGS Design Maps Summary Report

User–Specified Input

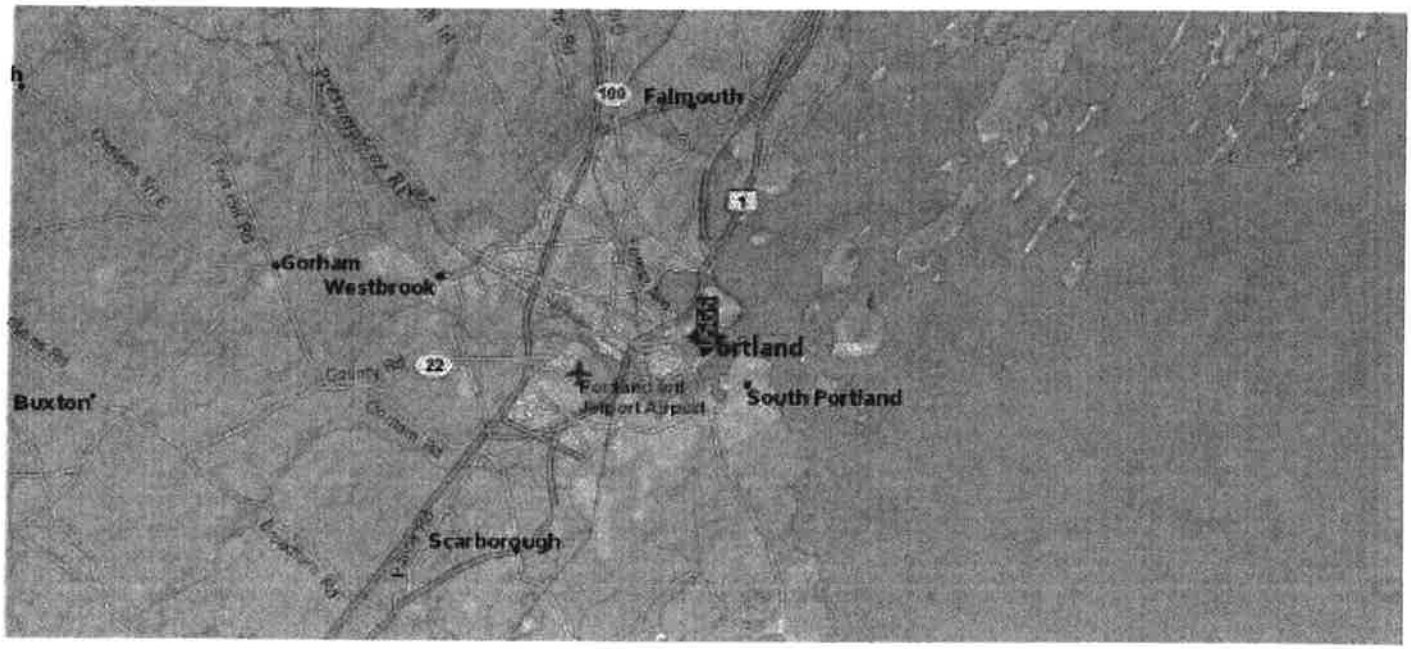
Report Title UNitil DAC Bldg
Mon August 8, 2016 20:02:59 UTC

Building Code Reference Document 2006/2009 International Building Code
(which utilizes USGS hazard data available in 2002)

Site Coordinates 43.6615°N, 70.2553°W

Site Soil Classification Site Class D – "Stiff Soil"

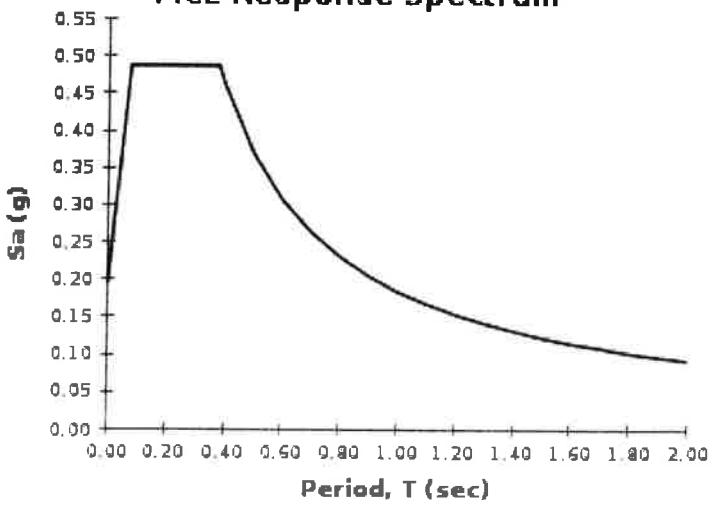
Occupancy Category I/II/III



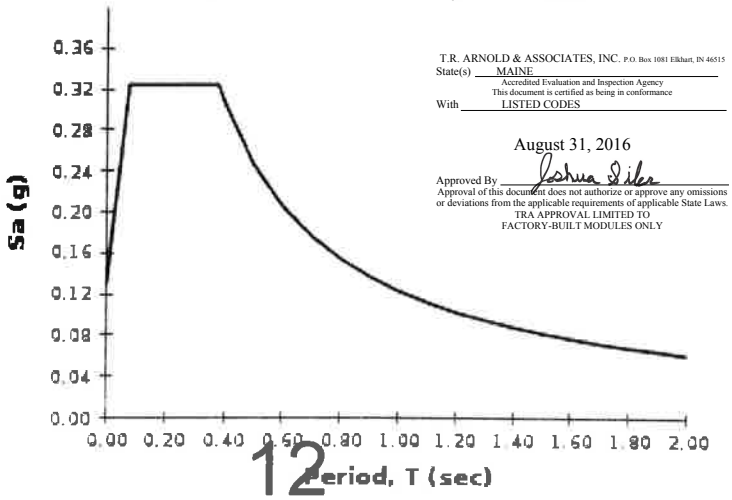
USGS–Provided Output

S_S =	0.314 g	S_{MS} =	0.487 g	S_{DS} =	0.324 g
S_1 =	0.077 g	S_{M1} =	0.184 g	S_{D1} =	0.123 g

MCE Response Spectrum



Design Response Spectrum



T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

PMC
17375 Crookes Farm Road
Rixeyville, VA 22737
T: 540.212.3900
http://www.pmceng.us
Engineering & Detailing

SEI/ASCE 7-05 Method 2 Wind Loading

Wind Loading Design Sheet ≤ 60'

by: Justin B. Currier
October 31, 2005

Project:	DAC Building
PMC Job# :	16077
Dsg Date:	8-Aug-2016

Basic wind speed (mph) :	99	<-- per Figure 6.1 or local code
BV Pressure, P_v (psf) :	25.09	
Exposure Category :	C	<-- per Section 6.5.6.3 definitions, pg 29
Importance Factor, I :	1.00	<-- per Table 6-1, pg 73
Building Height, K_h (ft) :	12.0	<-- per contract documents
Wind Directionality, K_d :	0.85	<-- per table 6-4, pg 80
Topographic Factor, K_{zt} :	1.00	<-- per Figure 6-4, pg 47
Int. Press. Coeff, GC_{pi} :	0.18	(+) <-- per Figure 6-5, pg 49
	-0.18	(-)

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Diller
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Element GC_p vs Area (Fig 6-11A)			
Area (sq-ft)	Zones 4	5	Windward 4 & 5
1	-1.10	-1.40	1.00
10	-1.10	-1.40	1.00
20	-1.05	-1.30	0.97
50	-0.98	-1.15	0.89
100	-0.93	-1.05	[illegible]
200	-0.88	-0.95	0.77
500	-0.80	-0.80	0.70
1000	-0.80	-0.80	0.70

Ht. (ft) \ GC_p	-2.5	-2.4	-2.30	-2.20	-2.10	-2.00	-1.40	-1.30	-1.15	-1.10	-1.05	-0.98	-0.95	-0.93	-0.88	-0.80	0.70	0.77	0.82	0.89	0.97	1.00
15	-48.6	-46.8	-45.0	-43.1	-41.3	-39.5	-28.6	-26.8	-24.1	-23.2	-22.3	-21.0	-20.5	-20.1	-19.2	-17.8	9.4	10.7	18.1	19.4	20.8	21.4
20	-51.4	-49.5	-47.6	-45.7	-43.8	-41.8	-30.3	-28.4	-25.5	-24.6	-23.6	-22.3	-21.7	-21.3	-20.3	-18.8	10.0	11.3	19.2	20.5	22.1	22.6
25	-53.7	-51.7	-49.7	-47.7	-45.7	-43.7	-31.7	-29.7	-26.7	-25.7	-24.7	-23.3	-22.7	-22.3	-21.3	-19.6	10.4	11.8	20.0	21.5	23.1	23.7
30	-56.0	-53.9	-51.8	-49.7	-47.7	-45.6	-33.0	-30.9	-27.8	-26.8	-25.7	-24.2	-23.6	-23.2	-22.2	-20.5	10.9	12.3	20.9	22.4	24.0	24.7
40	-59.4	-57.2	-55.0	-52.8	-50.6	-48.4	-35.0	-32.8	-29.5	-28.4	-27.3	-25.7	-25.1	-24.6	-23.5	-21.7	11.5	13.1	22.2	23.7	25.5	26.2
50	-62.3	-60.0	-57.7	-55.3	-53.0	-50.7	-36.7	-34.4	-30.9	-29.8	-28.6	-27.0	-26.3	-25.8	-24.6	-22.8	12.1	13.7	23.2	24.9	26.7	27.4
60	-64.6	-62.2	-59.8	-57.4	-54.9	-52.5	-38.1	-35.7	-32.1	-30.8	-29.6	-28.0	-27.2	-26.8	-25.5	-23.6	12.5	14.2	24.1	25.8	27.7	28.4
70	-66.9	-64.4	-61.9	-59.4	-56.9	-54.4	-39.4	-36.9	-33.2	-31.9	-30.7	-28.9	-28.2	-27.7	-26.4	-24.5	13.0	14.7	25.0	26.7	28.7	29.4
80	-69.2	-66.6	-64.0	-61.4	-58.8	-56.3	-40.8	-38.2	-34.3	-33.0	-31.7	-29.9	-29.2	-28.6	-27.4	-25.3	13.4	15.2	25.8	27.6	29.7	30.5
90	-70.9	-68.2	-65.6	-62.9	-60.3	-57.7	-41.8	-39.1	-35.2	-33.9	-32.5	-30.7	-29.9	-29.4	-28.0	-25.9	13.8	15.6	26.4	28.3	30.4	31.2
100	-72.0	-69.3	-66.6	-64.0	-61.3	-58.6	-42.5	-39.8	-35.7	-34.4	-33.1	-31.2	-30.4	-29.8	-28.5	-26.3	14.0	15.9	26.9	28.8	30.9	31.7
120	-74.9	-72.1	-69.3	-66.5	-63.7	-60.9	-44.1	-41.3	-37.2	-35.8	-34.4	-32.4	-31.6	-31.0	-29.6	-27.4	14.5	16.5	27.9	29.9	32.1	33.0
140	-77.7	-74.8	-71.9	-69.0	-66.1	-63.2	-45.8	-42.9	-38.6	-37.1	-35.7	-33.6	-32.8	-32.2	-30.7	-28.4	15.1	17.1	29.0	31.0	33.4	34.2
160	-79.4	-76.5	-73.5	-70.6	-67.6	-64.6	-46.8	-43.9	-39.4	-37.9	-36.5	-34.4	-33.5	-32.9	-31.4	-29.1	15.4	17.5	29.6	31.7	34.1	35.0
180	-81.7	-78.7	-75.6	-72.6	-69.5	-66.5	-48.2	-45.1	-40.6	-39.0	-37.5	-35.4	-34.5	-33.9	-32.3	-29.9	15.9	18.0	30.5	32.6	35.1	36.0
200	-83.4	-80.3	-77.2	-74.1	-71.0	-67.9	-49.2	-46.1	-41.4	-39.9	-38.3	-36.1	-35.2	-34.6	-33.0	-30.5	16.2	18.4	31.1	33.3	35.8	36.7
250	-87.4	-84.2	-80.9	-77.7	-74.4	-71.1	-51.6	-48.3	-43.4	-41.8	-40.1	-37.9	-36.9	-36.2	-34.6	-32.0	17.0	19.3	32.6	34.9	37.5	38.5
300	-90.9	-87.5	-84.1	-80.7	-77.3	-73.9	-53.6	-50.2	-45.1	-43.4	-41.7	-39.3	-38.3	-37.6	-35.9	-33.2	17.6	20.0	33.9	36.3	39.0	40.0
350	-93.7	-90.2	-86.7	-83.2	-79.7	-76.2	-55.3	-51.8	-46.5	-44.8	-43.0	-40.6	-39.5	-38.8	-37.1	-34.3	18.2	20.6	35.0	37.4	40.2	41.3
400	-96.6	-93.0	-89.4	-85.8	-82.2	-78.6	-56.9	-53.3	-47.9	-46.1	-44.3	-41.8	-40.7	-40.0	-38.2	-35.3	18.7	21.3	36.0	38.6	41.4	42.5
450	-98.9	-95.2	-91.5	-87.8	-84.1	-80.4	-58.3	-54.6	-49.1	-47.2	-45.4	-42.8	-41.7	-41.0	-39.1	-36.2	19.2	21.8	36.9	39.5	42.4	43.5
500	-101.2	-97.4	-93.6	-89.8	-86.1	-82.3	-59.6	-55.9	-50.2	-48.3	-46.4	-43.8	-42.7	-41.9	-40.0	-37.0	19.6	22.3	37.7	40.4	43.4	44.5

Table based upon pressure as defined in Section 6.5.10 with $q_z = 0.00256 K_z K_{zt} K_d V^2 I$ (psf) and 6.5.12.4.2 with $p = q(GC_p) - q_i(GC_{pi})$ (psf)

0115 IECS, LLC INPUT DATA 04-26-2016 17:57:23 Pg. 1

File: UNTITLED Name: DAC Building Job No: 16051 Mark: Front Door Designer: JBC

SECTION DIMENSIONS:

No. of Wythes = 1
Bot Wythe: Width = 144 in Thickness = 3.5 in Member Length = 109.5 in
Bott Wythe (no rvls/opngs): Area = 504 in2 M of I = 514.5 in4 Centroid from Bottom = 1.75 in

MATERIALS:	F'c (psi)	Ec (ksi)	F'ci (psi)	Eci (ksi)	Conc Wt (pcf)
Bot Wythe:	5000	4074	2500	2881	150

Average Relative Humidity = 70 %
Superimposed Load = 0 psf Fy, Reinf Bar Grade = 60 ksi Fpu, Strand = 270 ksi Lo-Lax = Yes

WELDED WIRE FABRIC:	A	B	C	D
WWF Area(in2/ft) =	0.42			
Cent frm Bot/Sect(in) =	1.75			

OPNGS:	A	B	C	D	E	F	G	H
X1(in)=	23.0							
X(in)=	86.0							
Y1(in)=	6.0							
Y(in)=	46.0							
Top W:	N							
Bot W:	Y							
Stem:	N							

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Diles
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

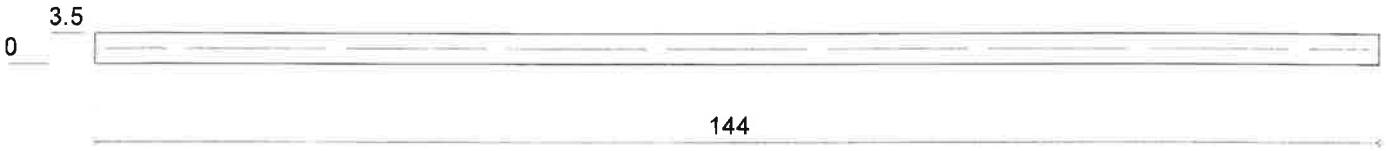
STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016

File: UNTITLED Name: DAC Building Job No: 16051 Mark: Front Door Designer: JBC

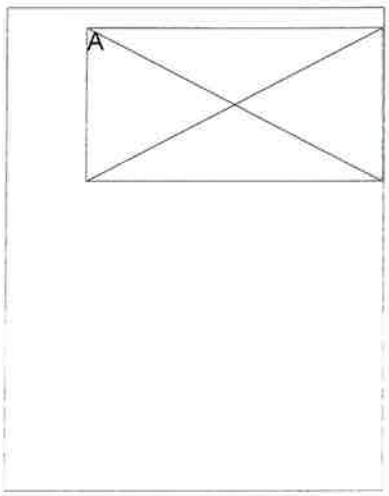
Applied Loads:
Service lateral suction, plf: 706.8 Pressure: 574.8
Lateral suction below mezz, plf: 0 Pressure: 0
Super. roof dead load in kips: 8.76
Ecc., e from inside face, in: -1
Super. roof live load in kips: 4.92
Ecc., e from inside face, in: -1
Horizontal surcharge at floor or grade, psf: 0
Active lateral earth pressure, psf: 0
Distance from base to top of retained earth, in: 0
Strand dev. length mult. at ends = 1 , at openings = 2
Seismic Coefficient, % = 10

Initial Prestress Loss = 0.00% (Calculated)
Final Prestress Loss = 0.00% (Calculated)
Outside temp, deg F: 110 Inside: 65
Initial member bow at midheight, in: 0
Column ties used or non-bearing member
Percent composite at ultimate: 100
Cracking stress coefficient: 7.5
Slenderness effects are included
Top support location from top of member, in: 0
Optional floor conn. loc. from bot. of member, in: 0
Bottom face location is outside
Floor connection is for a slab on grade
Percent composite for deflection: 0



T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Diller
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

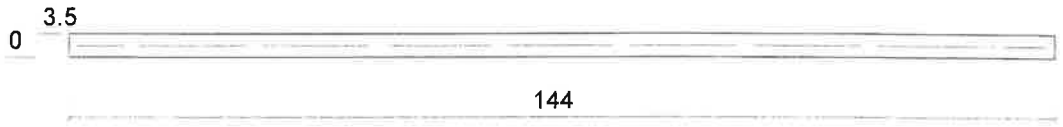


STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED
PROFESSIONAL ENGINEER
AUG 29 2016

File: UNTITLED Name: DAC Building Job No: 16051 Mark: Front Door Designer: JBC

LOAD CASES:

1 ACI 318-02 9-1 Dead
2 ACI 318-02 9-2 Live+T+Earth
3 ACI 318-02 9-3 Roof
4 ACI 318-02 9-4 Wind
5 ACI 318-02 9-5 Seismic
6 ACI 318-02 9-6 Wind+Earth
7 ACI 318-02 9-6 Wind
8 ACI 318-02 9-7 Seismic+Earth
9 ACI 318-02 9-7 Seismic
10 Service Dead + Temp.
11 Service Dead + Live
12 Service Dead + Wind
13 User Defined
14 User Defined

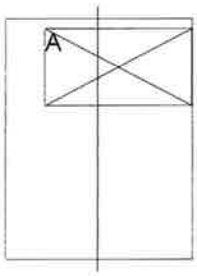


ACI 318 Phi factors used

	Pu	Mu-S	Phi-Mn S	Mu-P	Phi-Mn P		Pu	Mu-S	Phi-Mn S	Mu-P	Phi-Mn P
1	15.00	4.81	282.85	4.81	-282.85	2	15.31	6.89	282.95	6.89	-282.95
3	20.73	7.13	284.58	7.13	-284.58	4	15.31	151.12	282.95	-111.24	-282.95
5	13.84	9.44	282.50	-0.48	-282.50	6	9.64	147.76	281.24	-114.44	-281.24
7	9.64	147.76	281.24	-114.44	-281.24	8	9.64	8.00	281.24	-1.90	-281.24
9	9.64	8.00	281.24	-1.90	-281.24	10	10.71	4.67	281.56	4.67	-281.56
11	15.63	5.29	283.04	5.29	-283.04	12	10.71	92.58	281.56	-69.12	-281.56
13	0.00	0.00	278.33	0.00	-278.33	14	0.00	0.00	278.33	0.00	-278.33

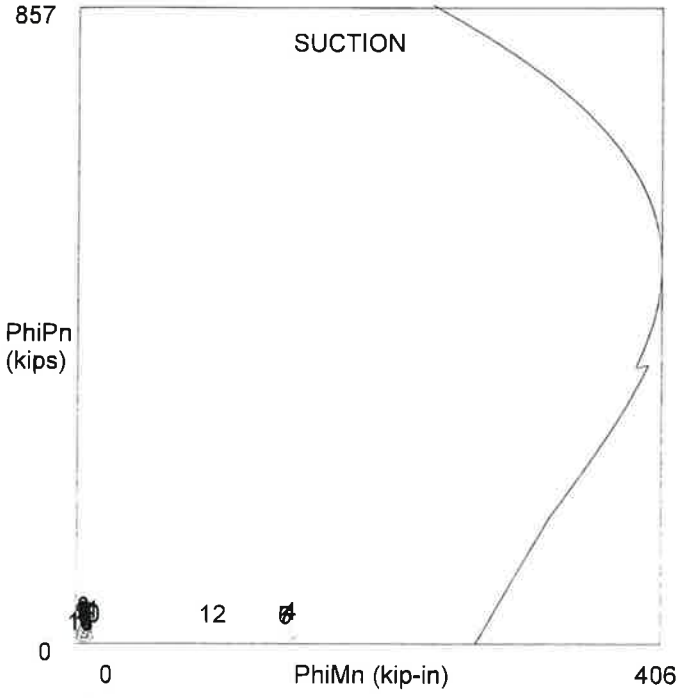
Section cut location from
left end (in) = 54.20252

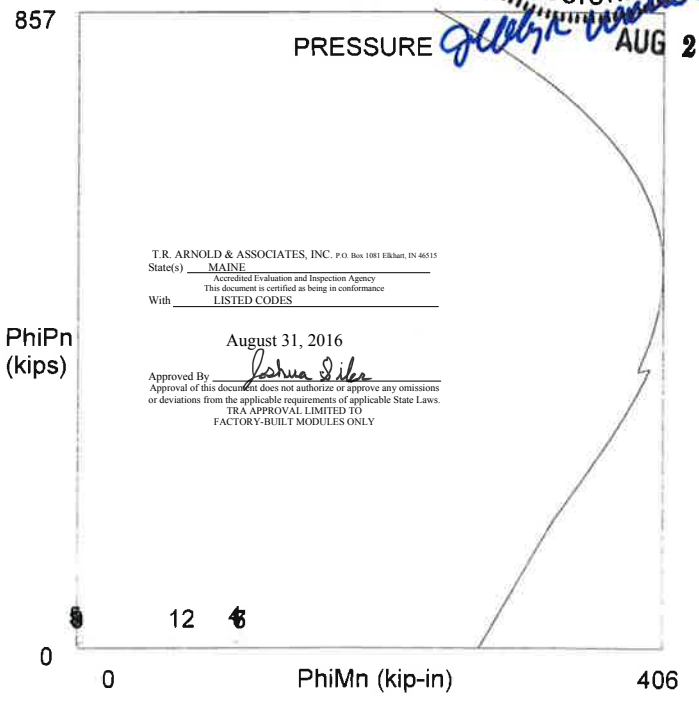
Compr. face not reversed.



STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016





T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Diller
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

COM*check* Software Version 4.0.2.0

Envelope Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	Unitil Dac Building
Location:	Portland, Maine
Climate Zone:	6a
Project Type:	New Construction

Construction Site:
Portland, ME

Owner/Agent:

Designer/Contractor:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

Building Area	Floor Area
1-Warehouse : Nonresidential	120

Additional Efficiency Package

On-site Renewable Energy

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Roof 1: Insulation Entirely Above Deck, [Bldg. Use 1 - Warehouse]	120	---	13.1	0.072	0.032
Exterior Wall 1: Solid Concrete:3" Thickness, Normal Density, Furring: None, [Bldg. Use 1 - Warehouse]	100	---	13.1	0.069	0.080
Exterior Wall 2: Solid Concrete:3" Thickness, Normal Density, Furring: None, [Bldg. Use 1 - Warehouse]	120	---	13.1	0.069	0.080
Exterior Wall 3: Solid Concrete:3" Thickness, Normal Density, Furring: None, [Bldg. Use 1 - Warehouse]	100	---	13.1	0.069	0.080
Exterior Wall 4: Solid Concrete:3" Thickness, Normal Density, Furring: None, [Bldg. Use 1 - Warehouse]	120	---	13.1	0.069	0.080
Door 1: Uninsulated Double-Layer Metal, Swinging, [Bldg. Use 1 - Warehouse]	21	---	---	0.158	0.370
Floor 1: Slab-On-Grade:Unheated, [Bldg. Use 1 - Warehouse] (b)	30	---	---	0.730	0.550

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) Slab-On-Grade proposed and budget U-factors shown in table are F-factors.

Envelope PASSES: Design 0.0% better than code

Envelope Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.2.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Jaclyn Reed/Designer
Name - Title

Jaclyn Reed
Signature

7/6/16
Date

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016

COMcheck Software Version 4.0.2.0

Interior Lighting Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	Unitil Dac Building
Project Type:	New Construction

Construction Site:
Portland, ME

Owner/Agent:

Designer/Contractor:

Additional Efficiency Package

On-site Renewable Energy

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Common Space Types:Workshop	120	1 .59	191
		Total Allowed Watts =	191

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Common Space Types:Workshop				
Linear Fluorescent 1: Interior: 48" T8 32W: Electronic:	2	2	32	64
			Total Proposed Watts =	64

Interior Lighting PASSES: Design 66% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.2.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Jaclyn Reed/Designer
Name - Title

Jaclyn Reed
Signature

7/6/16
Date

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED
PROFESSIONAL ENGINEER

AUG 29 2016

COMcheck Software Version 4.0.2.0

Exterior Lighting Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	Unitil Dac Building
Project Type:	New Construction
Exterior Lighting Zone	3 (Other)

Construction Site:
Portland, ME

Owner/Agent:

Designer/Contractor:

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
Main entry	3 ft of door	30	Yes	90
			Total Tradable Watts (a) =	90
			Total Allowed Watts =	90
			Total Allowed Supplemental Watts (b) =	750

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
(b) A supplemental allowance equal to 750 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Main entry (3 ft of door width): Tradable Wattage				
LED 1: Exterior: Other:	1	1	21	21
			Total Tradable Proposed Watts =	21

Exterior Lighting PASSES: Design 98% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.2.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Jaclyn Reed/Designer
Name - Title

Jaclyn Reed
Signature

7/6/16
Date

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016
Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER
AUG 29 2016

COM*check* Software Version 4.0.2.0

Mechanical Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	Unitil Dac Building
Location:	Portland, Maine
Climate Zone:	6a
Project Type:	New Construction

Construction Site:
Portland, ME

Owner/Agent:

Designer/Contractor:

Additional Efficiency Package

On-site Renewable Energy

Mechanical Systems List

Quantity	System Type & Description
1	HVAC System 1 (Single Zone): Heating: 1 each - Unit Heater, Electric, Capacity = 5 kBtu/h No minimum efficiency requirement applies Cooling: 1 each - Packaged Terminal Unit, Capacity = 22 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 11.01 EER, Required Efficiency = 9.50 EER Fan System: None

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.2.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Jaclyn Reed/Designer
Name - Title

Jaclyn Reed
Signature

7/6/16
Date

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Dike
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

STATE OF MAINE
Jeffrey R. Walton, Jr.
No. 12871
LICENSED PROFESSIONAL ENGINEER

AUG 29 2016

COM*check* Software Version 4.0.2.0

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR1][1]	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR8][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515 State(s) MAINE Accredited Evaluation and Inspection Agency This document is certified as being in conformance With LISTED CODES August 31, 2016 Approved By Joshua Sisler Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws. TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY
C402.4.1 [PR10][1]	The vertical fenestration area <= 30 percent of the gross above-grade wall area.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.4.1 [PR11][1]	The skylight area <= 3 percent of the gross roof area.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C406 [PR9][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C303.2 [FO4][2]	Slab edge insulation installed per manufacturer's instructions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.2.1 [FO6][1]	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.2.5 [FO3][2]	Slab edge insulation R-value.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.2.6 [FO12][3]	Radiant heating systems panels insulated to >=R-3.5 on face opposite space being heated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C403.2.4.5, C403.2.4.6 [FO9][3]	Snow/ice melting system sensors for future connection to controls. Freeze protection systems have automatic controls installed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Framing / Rough-In Inspection	Complies?	Comments/Assumptions
C303.1.3 [FR12][2]	Fenestration products rated in accordance with NFRC.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.1.3 [FR13][1]	Fenestration products are certified as to performance labels or certificates provided.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.4.3 [FR10][1]	Vertical fenestration SHGC value.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.4.3, C402.4.3.4 [FR8][1]	Vertical fenestration U-Factor.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.4.4 [FR14][2]	U-factor of opaque doors associated with the building thermal envelope meets requirements.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.5.1.2.1 [FR19][1]	The building envelope contains a continuous air barrier that is sealed in an approved manner and material permeability <= 0.004 dfm/ft2. Air barrier penetrations are sealed in an approved manner.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.2, C402.5.4 [FR18][3]	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.7 [FR17][3]	Vestibules are installed on all building entrances. Doors have self-closing devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Silva
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.5, C403.2.4.3 [ME3][3]	Stair and elevator shaft vents have motorized dampers that automatically close.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.5, C403.2.4.3 [ME58][3]	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.12.1 [ME65][3]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.2.12.3 [ME117][2]	Fans have efficiency grade (FEG) >= 67. The total efficiency of the fan at the design point of operation <= 15% of maximum total efficiency of the fan.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.13 [ME71][2]	Unenclosed spaces that are heated use only radiant heat.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.3 [ME55][2]	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.2.6.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.6.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.7 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.2.7(1) and C403.2.7(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.8 [ME116][3]	Approved field test used to evaluate design air flow rates and demonstrate proper capture and containment of kitchen exhaust systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515 State(s) MAINE Accredited Evaluation and Inspection Agency This document is certified as being in conformance With LISTED CODES August 31, 2016 Approved By Joshua Siler Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws. TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY
C403.2.9 [ME60][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.2.9 [ME10][2]	Ducts and plenums sealed based on static pressure and location.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.9.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.4.6 [ME110][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Silva
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1 [EL15][1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1 [EL18][1]	Occupancy sensors installed in required spaces.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1, C405.2.2.3 [EL23][2]	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.2.1 [EL22][2]	Automatic controls to shut off all building lighting installed in all buildings.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3 [EL16][2]	Daylight zones provided with individual controls that control the lights independent of general area lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.2 [EL20][1]	Primary sidelighted areas are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.3 [EL21][1]	Enclosed spaces with daylight area under skylights and rooftop monitors are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL4][1]	Separate lighting control devices for specific uses installed per approved lighting plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL8][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.5 [EL25][null]	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 30%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515 State(s) MAINE Accredited Evaluation and Inspection Agency This document is certified as being in conformance With LISTED CODES August 31, 2016 Approved By Joshua Siler Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws. TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY
C405.3 [EL6][1]	Exit signs do not exceed 5 watts per face.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6, C405.6.1 [EL24][1]	Exterior grounds lighting meets exterior lighting power requirements.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Siler
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Insulation Inspection	Complies?	Comments/Assumptions
C303.1 [IN3][1]	Roof insulation installed per manufacturer's instructions. Blown or poured loose-fill insulation is installed only where the roof slope is <=3 in 12.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.1 [IN10][2]	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.2 [IN7][1]	Above-grade wall insulation installed per manufacturer's instructions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.2.1 [IN14][2]	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.2.1 [IN17][3]	Insulation intended to meet the roof insulation requirements cannot be installed on top of a suspended ceiling. Mark this requirement compliant if insulation is installed accordingly.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.2.3 [IN6][1]	Above-grade wall insulation R-value.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.2.5 [IN8][2]	Floor insulation R-value.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.2.6 [IN18][3]	Radiant panels and associated components, designed for heat transfer from the panel surfaces to the occupants or indoor space are insulated with a minimum of R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.4.2.2 [IN2][1]	Roof R-value. For some ceiling systems, verification may need to occur during Framing Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
C402.5.1.1 [IN1][1]	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Silva
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17][3]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C303.3, C408.2.5.3 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.3 [FI51][3]	Where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening are located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms are sealed and insulated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.6 [FI37][1]	Weatherseals installed on all loading dock cargo doors.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C402.5.8 [FI26][3]	Recessed luminaires in thermal envelope to limit infiltration and be IC rated and labeled. Seal between interior finish and luminaire housing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.2 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.3 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515 State(s) MAINE Accredited Evaluation and Inspection Agency This document is certified as being in conformance With LISTED CODES August 31, 2016 Approved By Joshua Siles Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws. TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY
C403.2.4.2.1 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C405.4.1 [FI18][1]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Interior Lighting fixture schedule for values.*
C405.5.1 [FI19][1]	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Exterior Lighting fixture schedule for values.*
C406.5 [FI49][1]	On-site renewable efficiency package. One of the following levels of renewable energy must be satisfied: provide >= 1.75 Btu/h, or >= 0.50 watts per square foot of conditioned floor area or provide >= 3 percent of the energy used within the building for mechanical and service water heating equipment and lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.1 [FI7][3]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.1 [FI16][3]	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.3 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.3 [FI33][1]	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Silver
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Additional Comments/Assumptions:

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Dilts
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

T.R. ARNOLD & ASSOCIATES, INC. P.O. Box 1081 Elkhart, IN 46515
State(s) MAINE
Accredited Evaluation and Inspection Agency
This document is certified as being in conformance
With LISTED CODES

August 31, 2016

Approved By Joshua Silva
Approval of this document does not authorize or approve any omissions or deviations from the applicable requirements of applicable State Laws.
TRA APPROVAL LIMITED TO
FACTORY-BUILT MODULES ONLY