OSFM
NC DEPARTMENT OF INSURANCE

ENGINEERING
Tel 919.647.0000 Fax 919.715.0067

MIKE CAUSEY, INSURANCE COMMISSIONER & STATE FIRE MARSHAL
BRIAN TAYLOR, CHIEF STATE FIRE MARSHAL

October 9, 2023

Jamie Roe
Senior Plans Examiner and Building Inspector
Winston-Salem/Forsyth County Planning & Development Services Department
100 E. First Street / Bryce A. Stuart Building
Winston-Salem, NC 27101

RE: 2018 NCBC Appendix D D102.2.9 Roof structures and Section 703.5 Noncombustibility tests.

Mr. Roe:

This letter is in response to your request for formal interpretation to the Office of State Fire Marshal ("OSFM") dated August 30, 2023, which NCDOI received by email the same day.

Your letter states in relevant part:

"I am requesting a formal interpretation of the 2018 NC Building code sections Appendix D 102.2.9 Roof Structures in the Primary Fire District, 703.5 Noncombustibility Tests, and 703.5.1 Elementary Materials. We have a roof top structure that was installed without plan review or permit that involves a large wooden playground structure on the roof of the new Kaleideum Museum located at 120 W Third Street in the heart of the Winston-Salem primary fire district. The main structure is made up of various sizes of Black Locust logs and includes several glue lam beams and some standard pressure treated nominal lumber. Pursuant to NCBC D102.2.9, any structure "placed above the roof of any building within the fire district shall be of noncombustible material and shall be supported by construction of noncombustible material." There have been multiple conversations between Forsyth County building officials, fire code officials, fire marshal and chief, and members of the NCDOI code consultant team discussing the possible avenues of resolving this direct violation of the NC Building Code without removing the structure from the building. The most cost-effective method that has been presented is to treat the wooden structure with some type of fire-retardant coating, such as intumescent paint. It was mentioned in a recent Zoom meeting with David Rittlinger that this might be an acceptable method. My concern is that these types of coatings are designed to slow down the flame spread of a material and that it would not meet the requirements of a noncombustible material as described in NCBC 703.5.1 and ASTM E136. The other concern is the durability of the coating once applied. It states in NCBC 703.5 that "A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions." Being that the structure is on an open roof, this seems to be yet another direct violation of the code.

The purpose of this formal interpretation request is to have something concrete from DOI stating that the application of some type of coating would be an acceptable method to remedy this situation. Following my first meeting with the client, I was provided with a full set of plans for this structure. These plans have been attached to the email with this request. If this method is approved, I intend to require full documentation from the manufacturer to ensure that the coating does meet the noncombustible criteria, that it is approved for exterior use, what the recommended maintenance of said material should be in the given application, and that it is safe for direct human contact. I have included two pictures below to provide further description. Any assistance from the NCDOI team is greatly appreciated in this matter. Thank you!"

Remarks:

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

Code Analysis: Structures placed above the roof of any building within the fire district shall be of noncombustible material and shall be supported by construction of noncombustible material.

2018 NC Building Code
D102.2.9 Roof Structures. Structures, except aerial supports 12 feet (3658 mm) high or less, flagpoles, water tanks and cooling towers, placed above the roof of any building within the fire district shall be of noncombustible material and shall be supported by construction of noncombustible material.

….

Code Analysis: Building materials, including materials for structures shall be non-combustible per 2018 NCBC 703.5, 703.5.1 and 703.5.2.

2018 NC Building Code
703.5 Noncombustibility Tests. The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term "noncombustible" does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

> **703.5.1 Elementary Materials.** Materials required to be noncombustible shall be tested in accordance with ASTM E136.
>
> **703.5.2 Composite Materials.** Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible materials.

….

Code Analysis: The use of sprayed fire-resistant materials can be used such as flame-retardant coatings per 2018 NCBC 704.13.

2018 NC Building Code
704.13 Sprayed Fire-Resistant Materials (SFRM). Sprayed fire-resistant materials (SFRM) shall comply with Sections 704.13.1 through 704.13.5.

704.13.1 Fire-Resistance Rating. The application of SFRM shall be consistent with the fire-resistance rating and the listing, including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions and the use of bonding adhesives, sealants, reinforcing or other materials.

704.13.2 Manufacturer's Installation Instructions. The application of SFRM shall be in accordance with the manufacturer's installation instructions. The instructions shall include, but are not limited to, substrate temperatures and surface conditions and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

704.13.3 Substrate Condition. The SFRM shall be applied to a substrate in compliance with Sections 704.13.3.1 through 704.13.3.2.

704.13.3.1 Surface Conditions. Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale and any other condition that prevents adhesion. The substrates shall be free of primers, paints and encapsulants other than those fire tested and listed by a nationally recognized testing agency. Primed, painted or encapsulated steel shall be allowed, provided that testing has demonstrated that required adhesion is maintained.

704.13.3.2 Primers, Paints and Encapsulants. Where the SFRM is to be applied over primers, paints or encapsulants other than those specified in the listing, the material shall be field tested in accordance with ASTM E736. Where testing of the SFRM with primers, paints or encapsulants demonstrates that required adhesion is maintained, SFRM shall be permitted to be applied to primed, painted or encapsulated wide flange steel shapes in accordance with the following conditions:

1. The beam flange width does not exceed 12 inches (305 mm); or
2. The column flange width does not exceed 16 inches (400 mm); or
3. The beam or column web depth does not exceed 16 inches (400 mm).
4. The average and minimum bond strength values shall be determined based on a minimum of five bond tests conducted in accordance with ASTM E736. Bond tests conducted in accordance with ASTM E736 shall indicate an average bond strength of not less than 80 percent and an individual bond strength of not less than 50 percent, when compared to the bond strength of the SFRM as applied to clean uncoated 1/8-inch-thick (3.2 mm) steel plate.

704.13.4 Temperature. A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for not fewer than 24 hours after the application of the SFRM, unless the manufacturer's instructions allow otherwise.

704.13.5 Finished Condition. The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids, spalls, delamination or any exposure of the substrate. Surface irregularities of SFRM shall be deemed acceptable.

….

Conclusions:
The 2018 NC Building Code makes it very clear prescriptively that a structure, like the large wooden playground structure on the roof of the new Kaleideum Museum, shall be of noncombustible material and shall be supported by construction of noncombustible material. Alternatively, it is the interpretation of this office in applying 2018 NC Administrative Code and Policies Section 105 Alternate Material, Design or Methods, that flame-retardant coatings may be used to treat the wood structure and members if suitable for the specific application and the flame-retardant coatings are reapplied on a maintenance schedule per the manufacturer's installation instructions. In the evaluation of any alternative material, design or method, the authority having jurisdiction has the authority to request all necessary technical information it deems relevant to evaluate if the requested alternative material, design or method provides the equivalent level of protection of public health, safety and welfare as required by the code. The acceptance of any alternative material, design or method is at the sole discretion of the authority having jurisdiction.

Sincerely,

David B. Rittlinger, PE, LEED AP
(Interim) Deputy Commissioner of Engineering and Chief Code Consultant
NCDOI-OSFM Engineering & Codes Division

cc: Bridget Herring, Chair – BCC
Mark Matheny, Vice-Chair – BCC
Michael Ali, Chair, Commercial Super Committee - BCC
Nathan Childs, Esq., NCDOJ, counsel for NC Building Code Council, nchilds@ncdoj.gov

ATTACHMENT A

(see attached correspondence below)

APPENDIX E
APPEALS
NORTH CAROLINA
BUILDING CODE COUNCIL

1429 Rock Quarry Road, Suite 105
Raleigh, North Carolina 27610
(919) 647-0008
david.rittlinger@ncdoi.gov

APPEAL TO NCDOI/NCBCC **Hearing Date** _____ / _____ / _____

GS 153A-374, GS 160A-434	GS 143-140, GS 143-141
Formal Interpretation by NCDOI_____	Appeal of Local Decision to NCBCC_____
Appeal of Local Decision to NCDOI_____	Appeal of NCDOI Decision to NCBCC_____

APPELLANT Jamie Roe **PHONE** (336) 747 - 7464 x _____
REPRESENTING City of Winston-Salem / Forsyth County Inspections
ADDRESS 100 E First Street
CITY Winston-Salem **STATE** NC **ZIP** 27101
E-MAIL jamisonr@cityofws.org **FAX** (336) 747 - 9428

North Carolina State Building Code, Volume 2018 **- Section** D102.2.9, 703.5

REQUEST ONE:
[V] **Formal Interpretation by NCDOI**
[ ] **Appeal of Local Decision to NCDOI**
[ ] **Appeal of Local Decision to NCBCC**
[ ] **Appeal of NCDOI Decision to NCBCC**

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

See attached document.
REASON:

APPEAL TO NCDOI/NCBCC

Signature _____ **DATE:** 8-30-23 **FORM 3/14/17**

202.9 Appeals

202.9.1 Engineering Division. A written technical interpretation shall be provided as specified in Section 203.2.1.2. Any person may appeal in writing an order, decision, or determination pertaining to the code or any state building law by filing written notice with the Commissioner of Insurance or his designee within ten (10) days after the order, decision, or determination. A copy of the appeal shall be furnished to each party.
(General Statutes 143-140, 153A-374 and 160A-434)

203.2.1 Interpretations

203.2.1.1 Informal Interpretations. The Engineering Division shall provide informal interpretations on code related matters either by e-mail, letter or telephone. These informal interpretations may be accepted by the local code enforcement official or party requesting the interpretation. Either party may request a formal interpretation of the code.

203.2.1.2 Formal Interpretations. Any person may request in writing a formal interpretation of the code. The request shall be addressed to the Chief Code Consultant for the Department of Insurance. The request shall be specific and shall reference the code sections in question. All formal interpretations shall be in writing. A formal interpretation shall be binding on all parties unless appealed to the Building Code Council as specified in Section 201.9.2. Formal interpretations determined to be of a general nature may be posted on the Department website. (General Statute 143-140)

203.2.2 Appeals. Any person may appeal in writing an order, decision, or determination of a code enforcement official pertaining to the code or any state building law. The appeal shall be addressed to the Chief Engineer for the Department of Insurance by filing written notice within ten (10) days after the order, decision, or determination. The appeal shall contain the type and size of the building in question, the location of the building, and shall reference the code sections in question. The decision shall be in writing and shall set forth the facts found. The decision rendered shall be based on the technical provisions of the code, public health and safety and shall be construed liberally to those ends. A decision shall be binding on all parties unless appealed to the Building Code Council as specified in Section 201.9.2. A copy of the appeal and written decision shall be furnished to each party. (General Statutes 153A-374 and 160A-434)

202.9.2 Building Code Council. The Building Code Council shall hear appeals from the decisions of State enforcement agencies relating to any matter related to the code. Any person wishing to appeal a decision of a State enforcement agency to the Building Code Council shall give written notice of appeal as follows:

202.9.2.1 Twenty one (21) copies including an original of the Notice of Appeal shall be filed with the Building Code Council c/o NC Department of Insurance, Engineering Division, 325 North Salisbury Street, Room 5_44, Raleigh, NC 27603 and one (1) copy shall be filed with the State enforcement agency from which the appeal is taken.

202.9.2.2 The Notice of Appeal shall be received no later than thirty (30) days from the date of the decision of the State enforcement agency.

202.9.2.3 The Notice of Appeal shall be legibly printed, typewritten or copied and shall contain the following:

(1) Name, address of the party or parties requesting the appeal.
(2) The name of the State enforcement agency, the date of the decision from which the appeal is taken, and a copy of the written decision received from the enforcement agency.
(3) The decision from which the appeal is taken shall be set forth in full in the Notice of Appeal or a copy of the decision shall be attached to all copies of the Notice of Appeal.
(4) The contentions and allegations of fact must be set forth in full in a clear and concise manner with reference to the sections of the code in controversy.
(5) The original Notice of Appeal shall be signed by the party or parties filing appeal.
(6) The Notice of Appeal shall be received by the first day of the month prior to the Building Code Council's quarterly scheduled meeting in order to be placed on the agenda for that meeting. The Chairman may schedule a special meeting to hear an appeal.

202.9.2.4 Upon the proper filing of the Notice of Appeal, the Building Code Council Secretary shall forward one (1) copy of the Notice of Appeal to each member of the Building Code Council. The Chairman may appoint a Hearing Committee to hear appeals. The Secretary shall send notice in writing to the party or parties requesting an appeal and to the Building Code Council Hearing Committee members at least fifteen (15) days prior to the Hearing Committee meeting. A written decision of the Hearing Committee meeting shall be provided to all Building Code Council Members. The actions of the Hearing Committee shall be final, unless appealed to the full Building Code Council in writing within 30 days of the Hearing Committee's action. If a Hearing Committee consists of at least seven Council members, it will constitute a quorum of the full Council. Further appeals shall be as specified in Section 202.9.3.

202.9.2.5 The Building Code Council shall, upon a motion of the State enforcement agency or on its own motion, dismiss appeals for the following reasons:

(1) Not pursued by the appellant or withdrawn;
(2) Appeal not filed in accordance with these rules; or
(3) Lack of jurisdiction.

202.9.2.6 When the Building Code Council finds that a State enforcement agency was in error in its interpretation of the code, the Building Code Council shall remand the case to the agency with instructions to take such actions as the Building Code Council directs. When the Building Code Council finds on appeal that materials or methods of construction proposed are equivalent to those required by the code, the Building Code Council shall remand the case to the State enforcement agency with instructions to permit the use of such materials or methods of construction. The Building Code Council shall immediately initiate procedures for amending the code to permit the use of such materials or methods of construction.

202.9.2.7 The Building Code Council shall provide a written decision setting forth the findings of fact and the Building Code Council's conclusions to each party or parties filing the appeal and to the State enforcement agency from which the appeal was taken.

202.9.3 Superior Court. Whenever any person desires to appeal a decision of the Building Code Council or a decision of a State or local enforcement agency, he may appeal either to the Wake County Superior Court or the Superior Court of the county in which the proposed building is to be situated in accordance with the provisions of Chapter 150B of the General Statutes.
(General Statute 143-141(d))

Formal Interpretation Request

I am requesting a formal interpretation of the 2018 NC Building code sections Appendix D 102.2.9 Roof Structures in the Primary Fire District, 703.5 Noncombustibility Tests, and 703.5.1 Elementary Materials. We have a roof top structure that was installed without plan review or permit that involves a large wooden playground structure on the roof of the new Kaleideum Museum located at 120 W Third Street in the heart of the Winston-Salem primary fire district. The main structure is made up of various sizes of Black Locust logs and includes several glue lam beams and some standard pressure treated nominal lumber. Pursuant to NCBC D102.2.9, any structure "placed above the roof of any building within the fire district shall be of noncombustible material and shall be supported by construction of noncombustible material." There have been multiple conversations between Forsyth County building officials, fire code officials, fire marshal and chief, and members of the NCDOI code consultant team discussing the possible avenues of resolving this direct violation of the NC Building Code without removing the structure from the building. The most cost-effective method that has been presented is to treat the wooden structure with some type of fire-retardant coating, such as intumescent paint. It was mentioned in a recent Zoom meeting with David Rittlinger that this might be an acceptable method. My concern is that these types of coatings are designed to slow down the flame spread of a material and that it would not meet the requirements of a noncombustible material as described in NCBC 703.5.1 and ASTM E136. The other concern is the durability of the coating once applied. It states in NCBC 703.5 that "A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions." Being that the structure is on an open roof, this seems to be yet another direct violation of the code.

The purpose of this formal interpretation request is to have something concrete from DOI stating that the application of some type of coating would be an acceptable method to remedy this situation. Following my first meeting with the client, I was provided with a full set of plans for this structure. These plans have been attached to the email with this request. If this method is approved, I intend to require full documentation from the manufacturer to ensure that the coating does meet the noncombustible criteria, that it is approved for exterior use, what the recommended maintenance of said material should be in the given application, and that it is safe for direct human contact. I have included two pictures below to provide further description. Any assistance from the NCDOI team is greatly appreciated in this matter. Thank you!

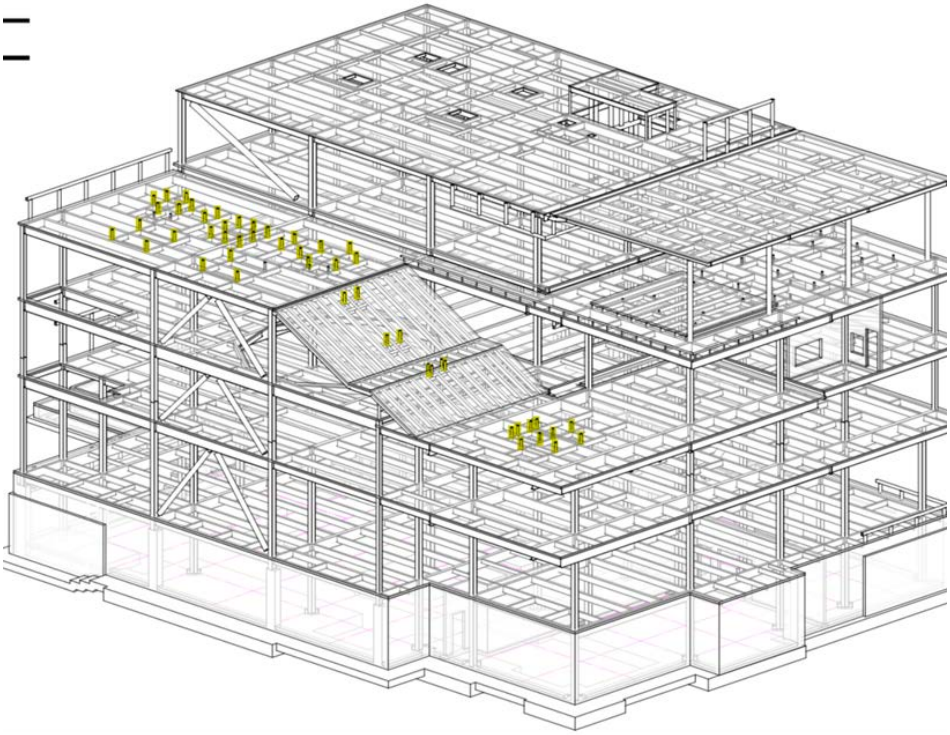
Respectfully,

Jamie Roe

Senior Plans Examiner / Level III Building Inspector

City of Winston-Salem / Forsyth County Inspections

August 30, 2023




NOTICE
NOTICE
DO NOT
ENTER
Gensler

Alex Irvin

From: Doug Coble
Sent: Tuesday, May 2, 2023 1:14 PM
To: Andrew Danley
Cc: Alex Irvin; Nathan Champion; Danny Niday
Subject: RE: Kaleideum Stamped Drawings copy.pdf

All,

The few things I can see that may need to be provided for city plan review are:

- Cut sheet for the netting showing the type of material and fire rating / flame spread rating.
- Cut sheet for the Trex board- They will most likely be looking at the thickness and flame rating. As a side note from what I have read from some generic cut sheets it has the same fire rating properties as standard wood finishes (Class C). You would need to look at the exact manufacture of the product to provide this information.
- Rubber Playground Mat and rubber surfacing would need the cut sheet showing the fire rating / flame spread rating.
- Does the glulam beams have any fire rating or fire-retardant finish.
- What is the slide material? Is this a plastic slide or metal slide? If plastic does it have any fire rating / flame spread rating.

These are just a few questions that stand out to me by first look. As always you can submit this and wait for plan review comments and get this documentation in order if needed.

If you have any questions that I have not answered or need to answer, please let me know.

Hope this helps,

Doug Coble
Assistant Superintendent

1923 - 2023

(336) 407-1176
doug.coble@flblum.com
www.flblum.com

From: Andrew Danley <andrew.danley@flblum.com>
Sent: Tuesday, May 2, 2023 11:32 AM
To: Doug Coble <doug.coble@flblum.com>
Cc: Alex Irvin <AIrvin@flblum.com>; Nathan Champion <nchampion@flblum.com>; Danny Niday <dniday@flblum.com>
Subject: Kaleideum Stamped Drawings copy.pdf

Andrew Danley
Assistant Superintendent

1923 - 2023

(336) 528-9117
andrew.danley@flblum.com
www.flblum.com

KALEIDEUM PLAYGROUND

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

NO.	REVISION	DATE
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PROJECT: KALEIDEUM

TITLE: COVER SHEET

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

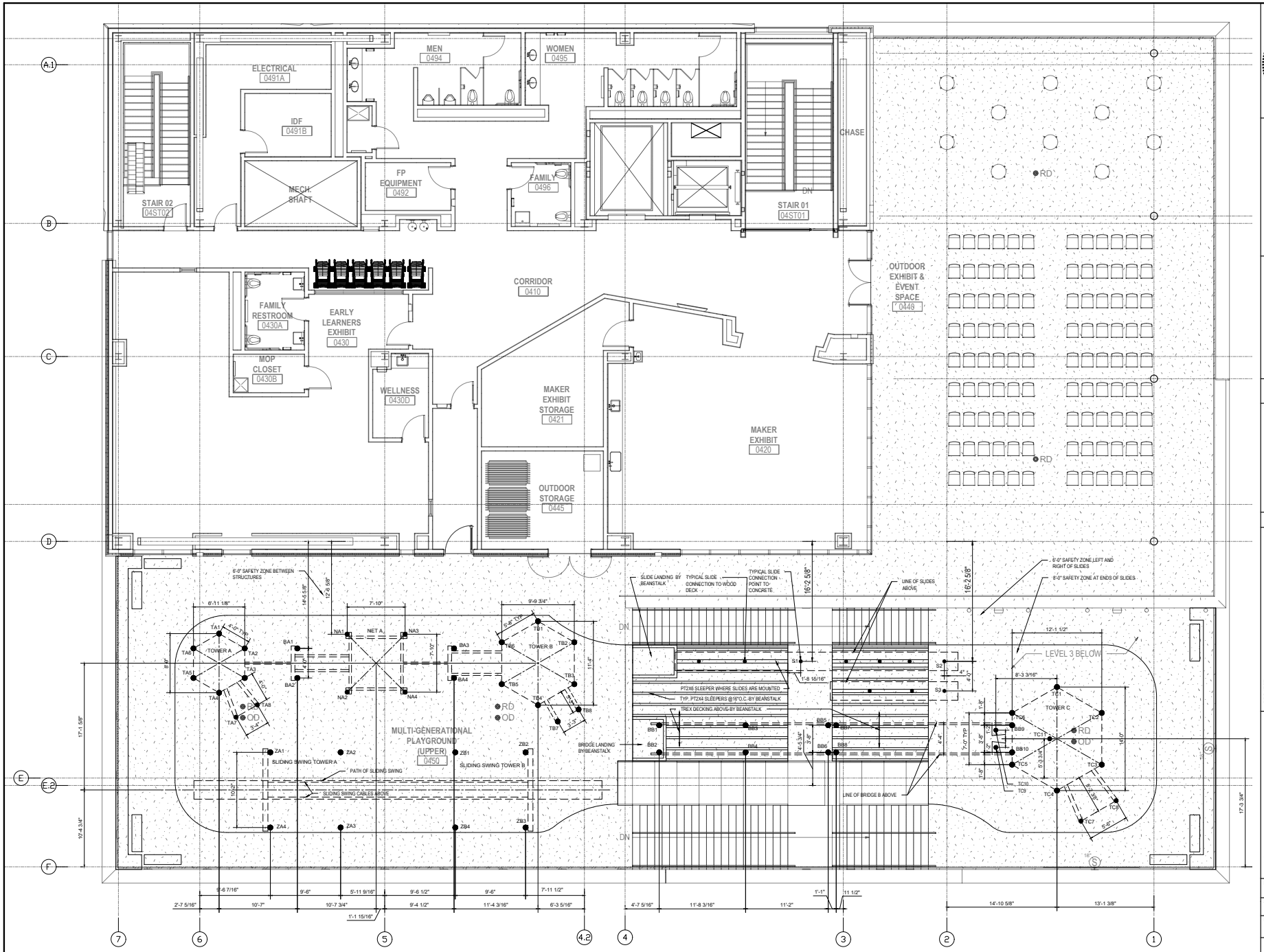
SCALE: NONE

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

SHEET: S1

OF: 11



1 BEANSTALK CONNECTION POINTS

Scale: 1/8"=1'-0"

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

NO.	REVISION	DATE
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PROJECT: KALEIDEUM

TITLE: BEANSTALK CONNECTION POINTS

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

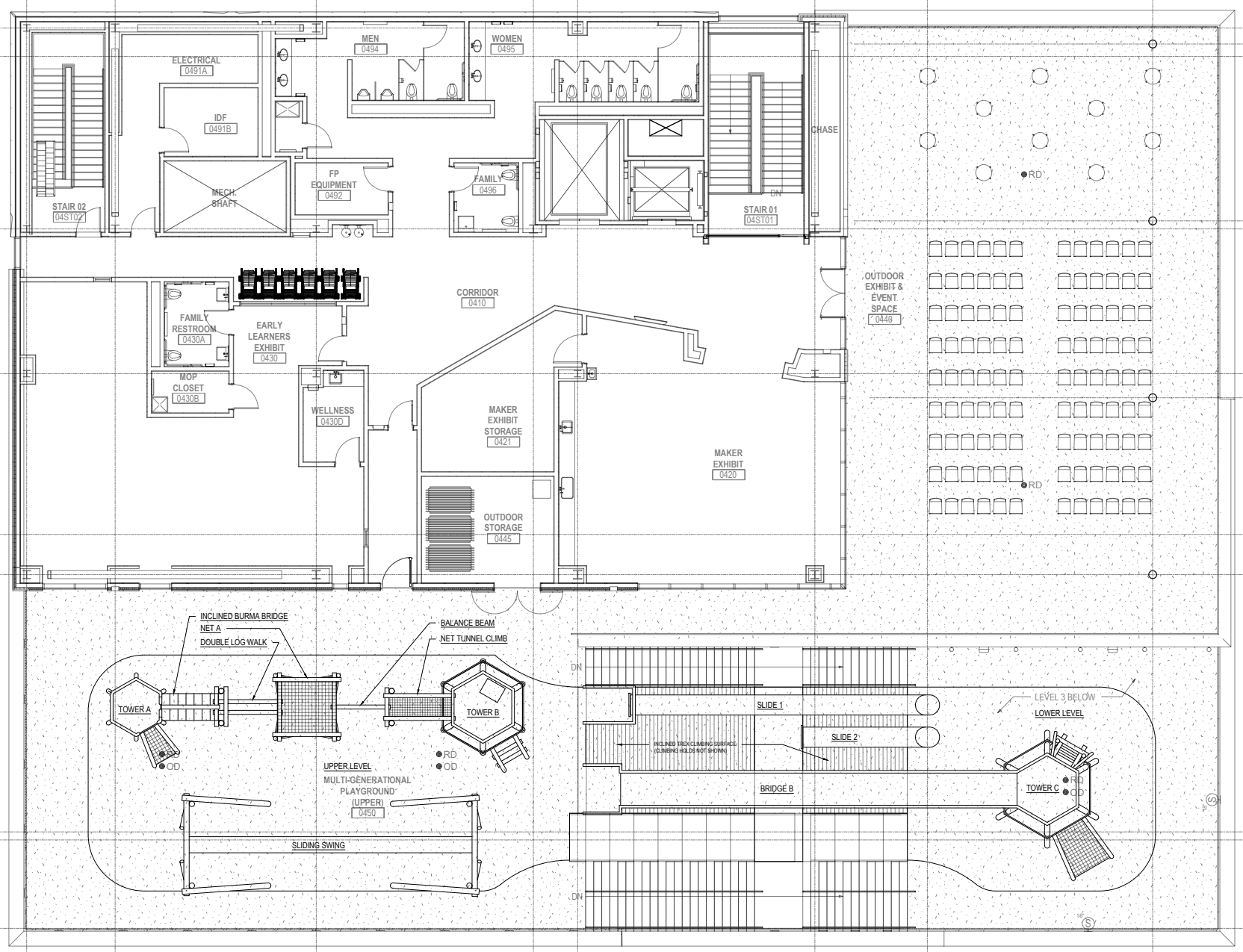
SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

SHEET: S2

OF: 11



1 PLAN
Scale: 1/8"=1'-0"

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

NO.	REVISION	DATE
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PROJECT: KALEIDEUM

TITLE: PLAYGROUND PLAN

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

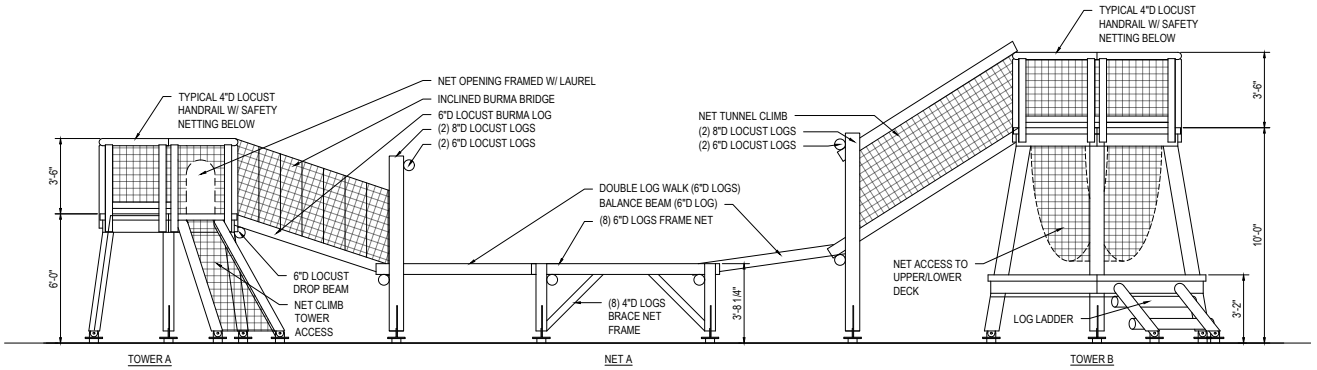
SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

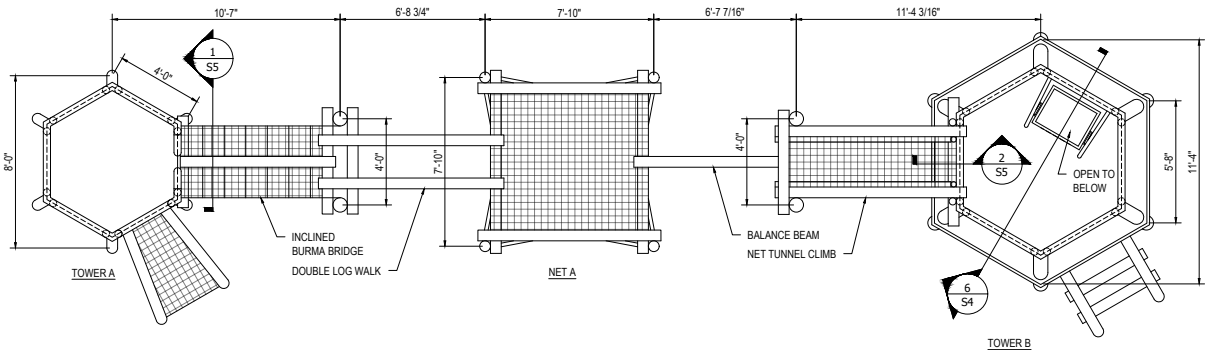
SHEET: S3

OF: 11



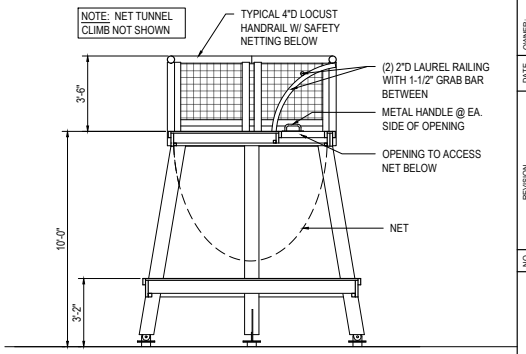
1 TOWER A, NET A,TOWER B-ELEVATION

Scale: 1/4"=1'-0"



2 TOWER A, NET A,TOWER B-PLAN

Scale: 1/4"=1'-0"



6 TOWER B-SECTION

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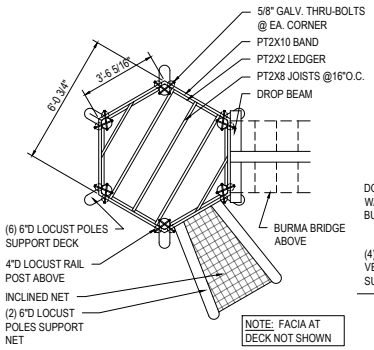
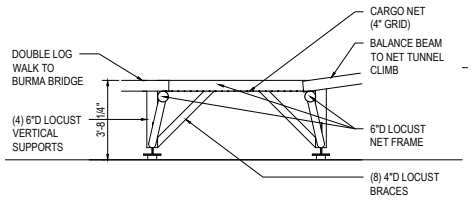


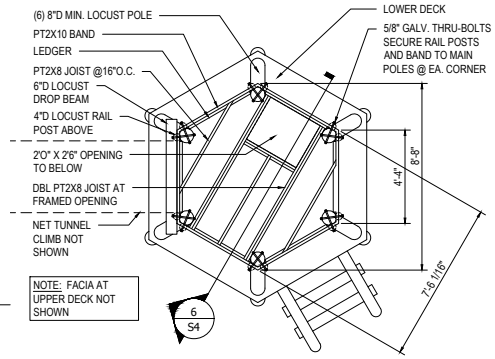
3 TOWER A-FRAMING PLAN

Scale: 1/4"=1'=0"



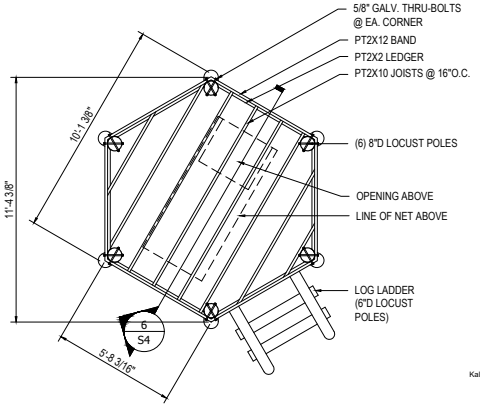
4 NET A-SECTION

Scale: 1/4"=1'-0"



5 TOWER B-UPPER DECK FRAMING PLAN

Scale: 1/4"=1'-0"



7 TOWER B-LOWER DECK FRAMING PLAN

Scale: 1/4"=1'-0"

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

NO.	REVISION	DATE
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PROJECT: KALEIDEUM

TITLE: TOWER A-TOWER B-NET A

DESIGNED BY: BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

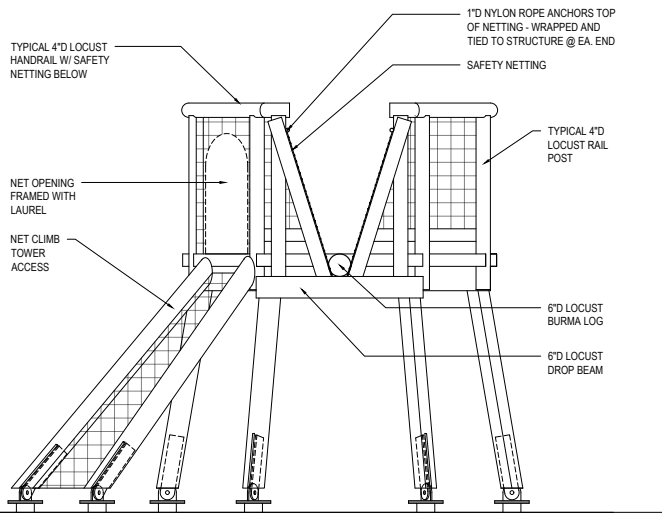
DATE: February 15, 2023

SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

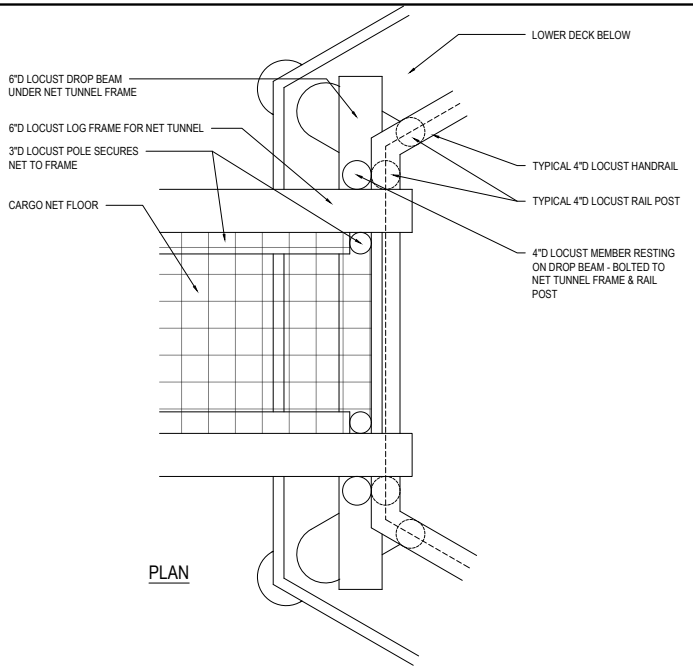
DWN BY: CM

SHEET: S4 OF: 11

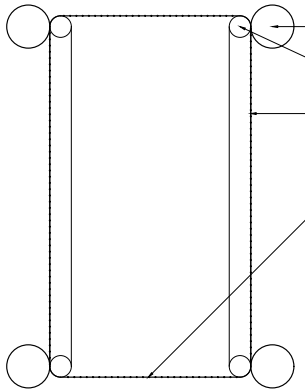


1 BURMA BRIDGE DETAIL

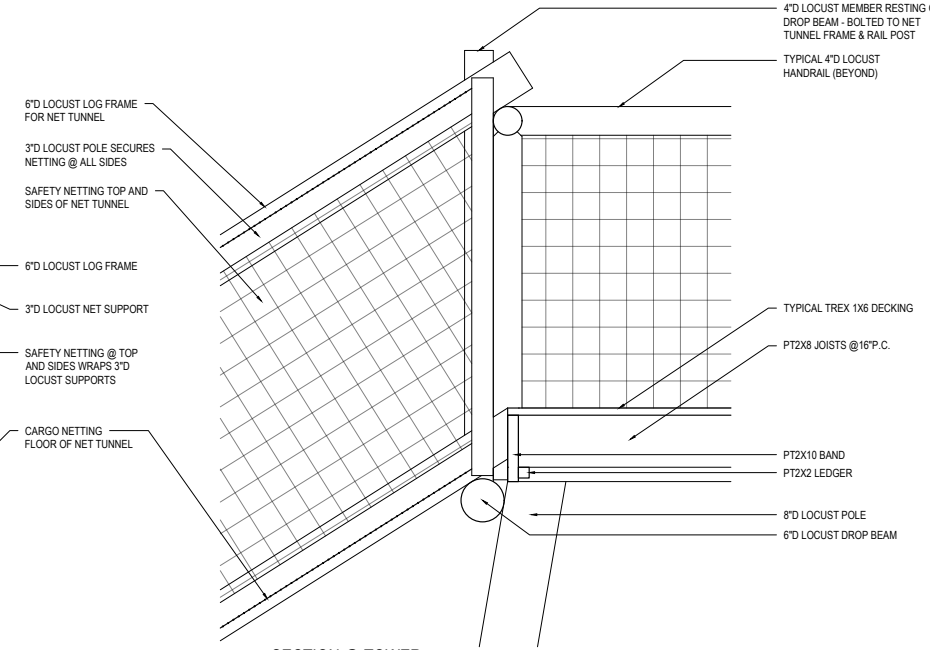
Scale: 1/2"=1'-0"



PLAN



SECTION @ NET TUNNEL



SECTION @ TOWER

2 DETAIL @ NET TUNNEL CLIMB & TOWER B

Scale: 1"=1'-0"

ENGINEER:
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

NO.	REVISION	DATE
1		
2		
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PROJECT: KALEIDEUM

TITLE: BURMA BRIDGE & NET TUNNEL CLIMB @ TOWER B

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

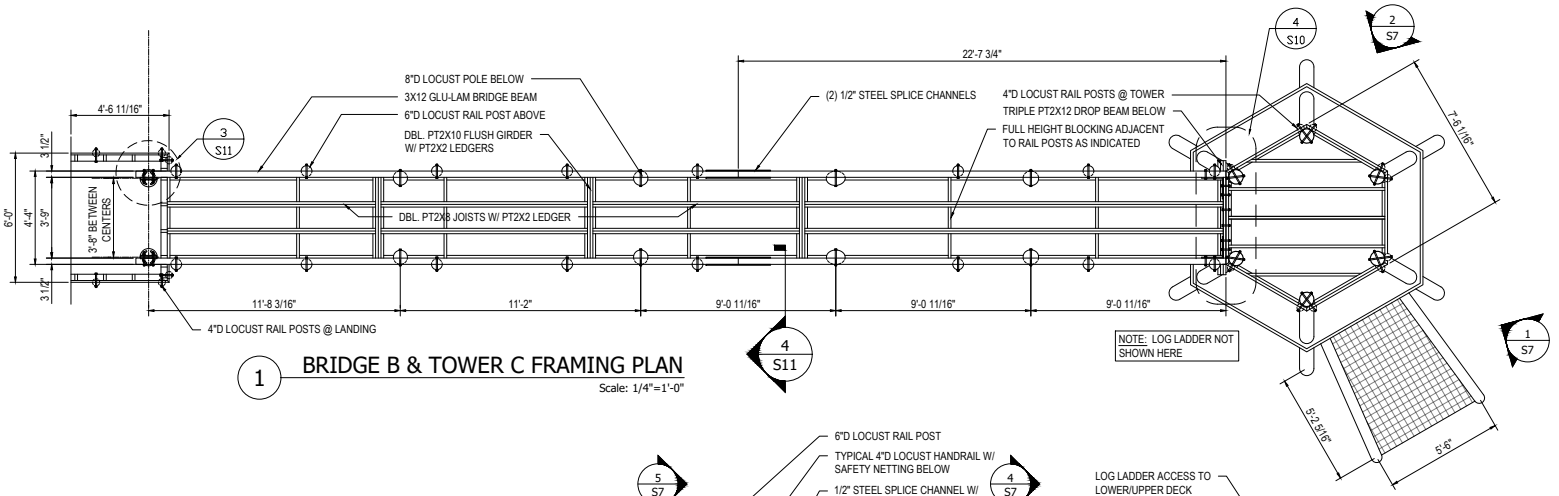
DATE: February 15, 2023

SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

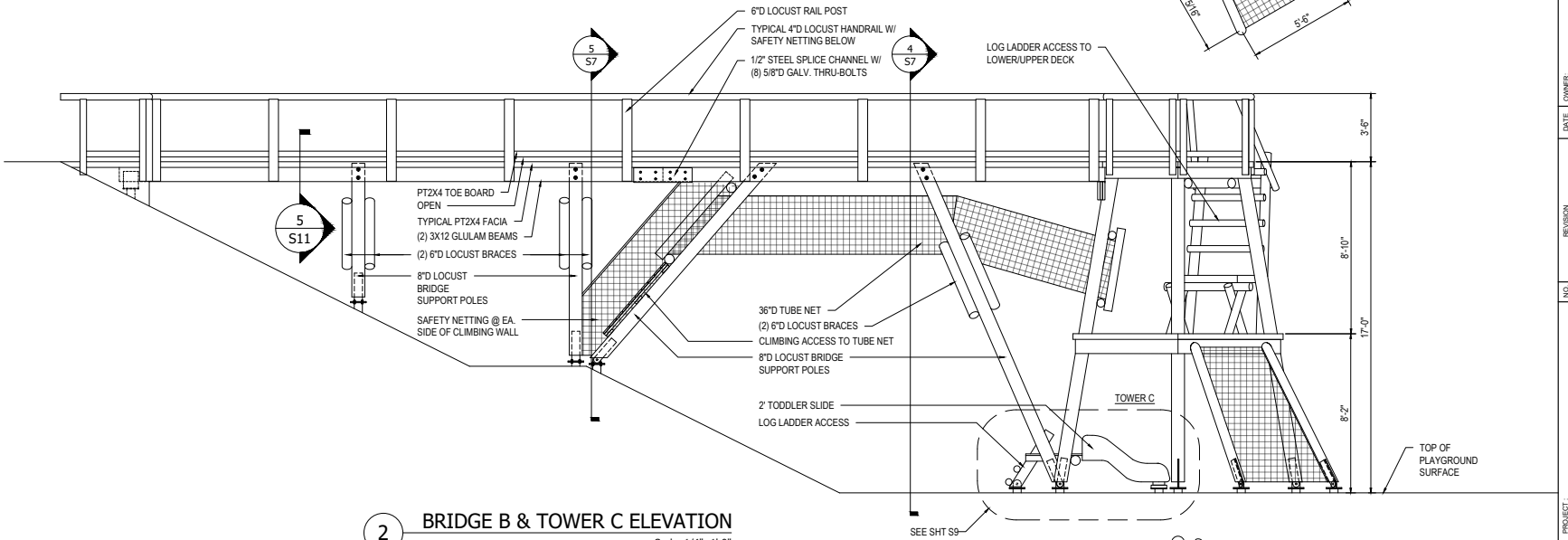
DWN BY: CM

SHEET: S5 OF: 11



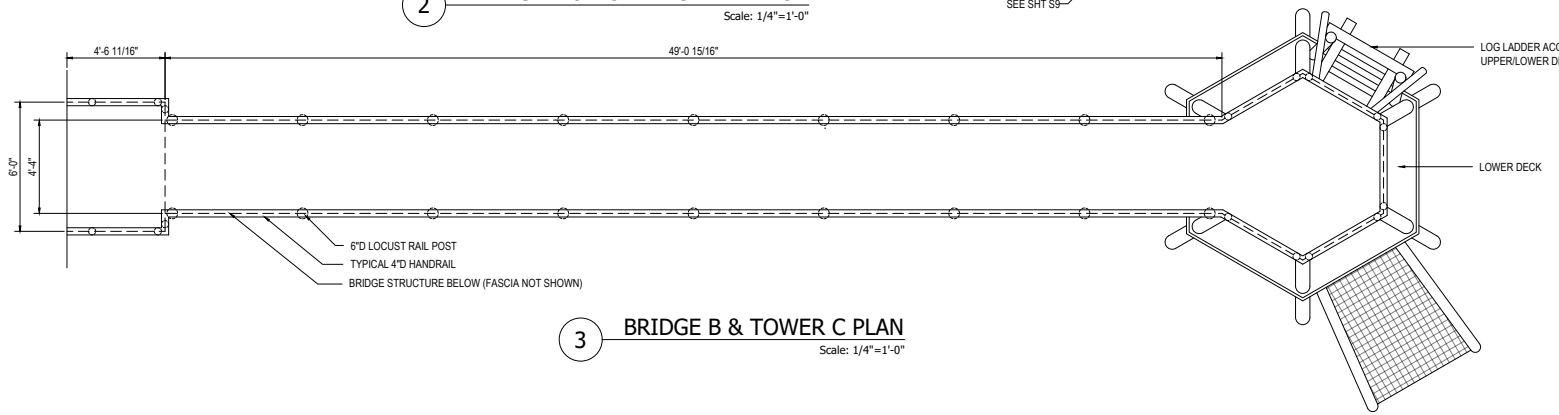
1 BRIDGE B & TOWER C FRAMING PLAN

Scale: 1/4"=1'-0"



2 BRIDGE B & TOWER C ELEVATION

Scale: 1/4"=1'-0"



3 BRIDGE B & TOWER C PLAN

Scale: 1/4"=1'-0"

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

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NO.	
1	
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PROJECT: KALEIDEUM

TITLE: BRIDGE B-TOWER C

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

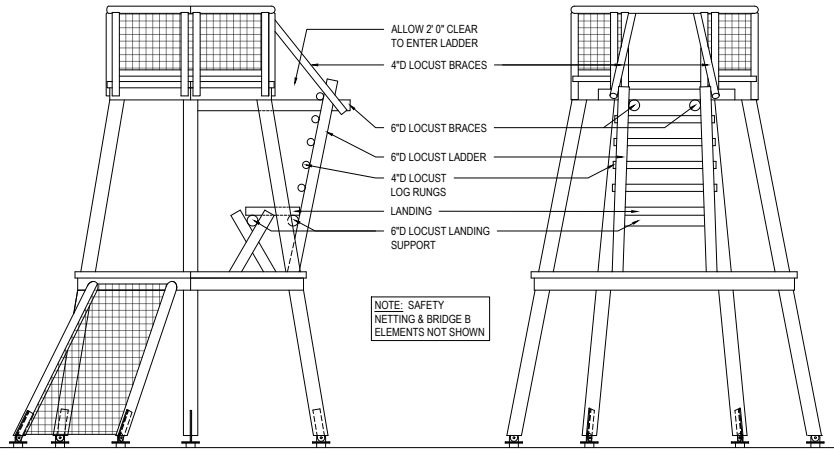
SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

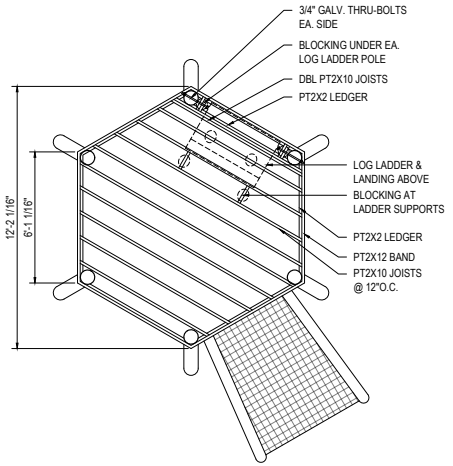
SHEET: S6

OF: 11

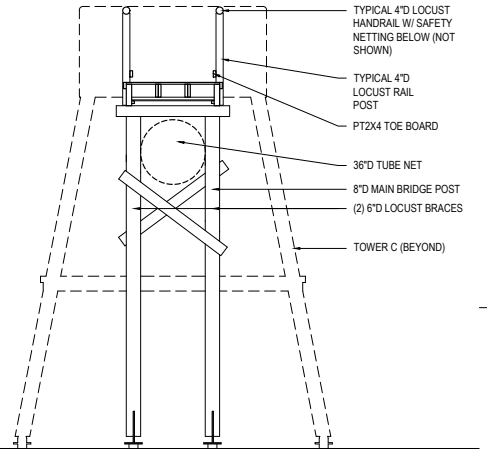


1 TOWER C-LOG LADDER SIDE ELEV.
Scale: 1/4"=1'-0"

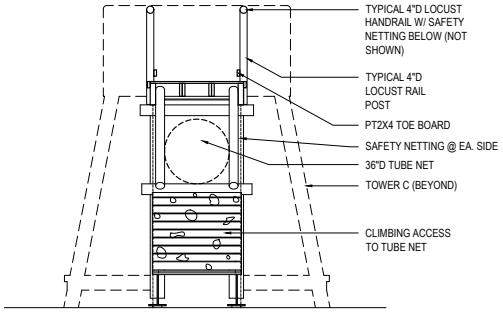
2 TOWER C-LOG LADDER FRONT ELEV.
Scale: 1/4"=1'-0"



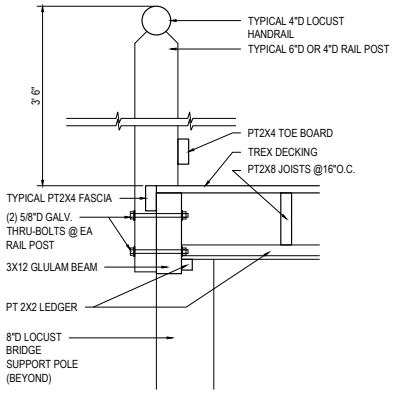
3 TOWER C-LOWER DECK FRAMING PLAN
Scale: 1/4"=1'-0"



4 BRIDGE B-SECTION
Scale: 1/4"=1'-0"



5 BRIDGE B-SECTION @ NET TUBE ENTRY
Scale: 1/4"=1'-0"



6 RAIL POST DETAIL
Scale: 1"=1'-0"

ENGINEER:
D. Matt Mullen, P.E.
D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

DATE

REVISION

NO.	REVISION	DATE
1		
2		
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PROJECT: KALEIDEUM

TITLE: TOWER C-BRIDGE B

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

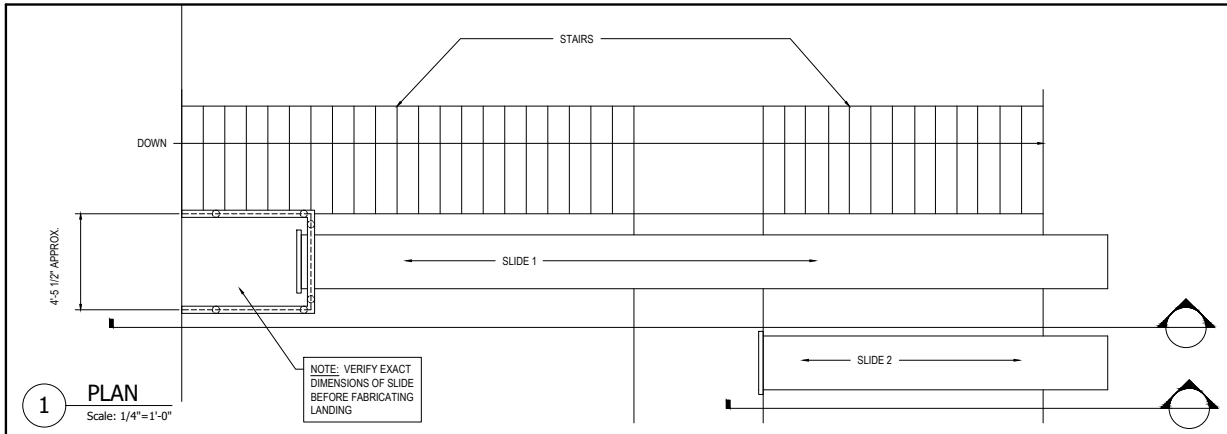
SCALE: AS NOTED

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

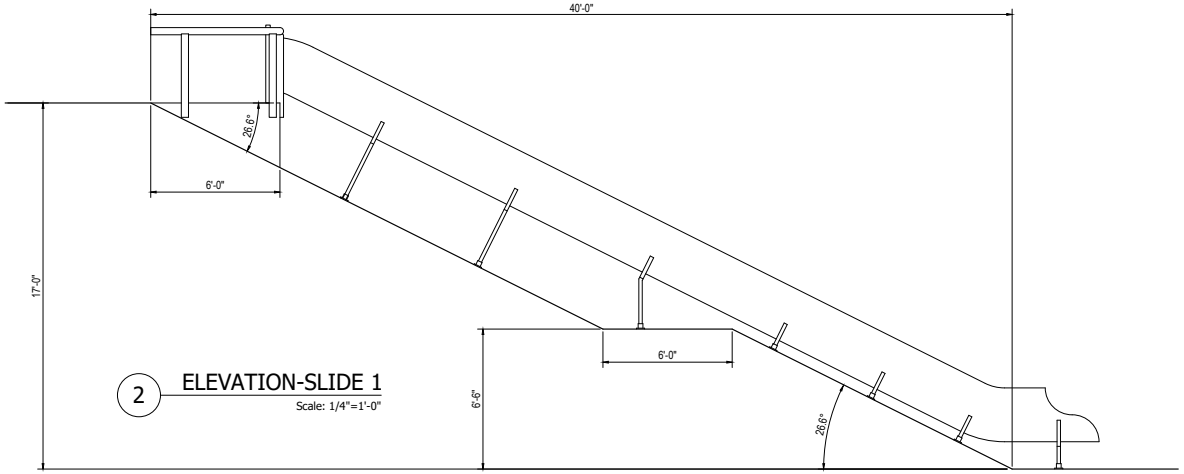
DWN BY: CM

SHEET: S7

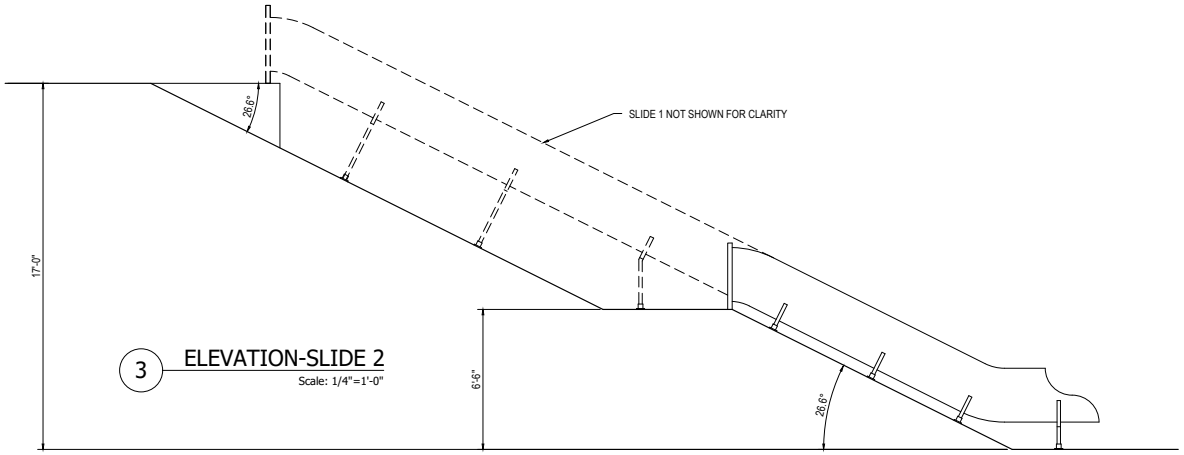
OF: 11



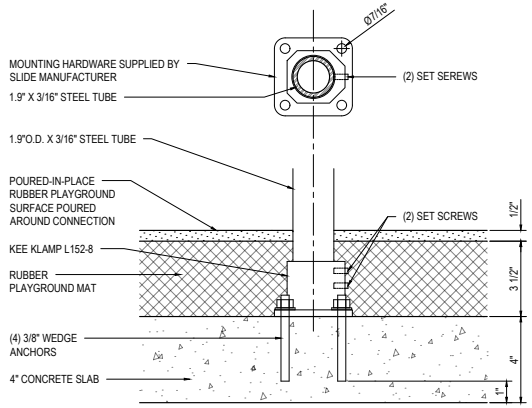
1 PLAN
Scale: 1/4"=1'-0"



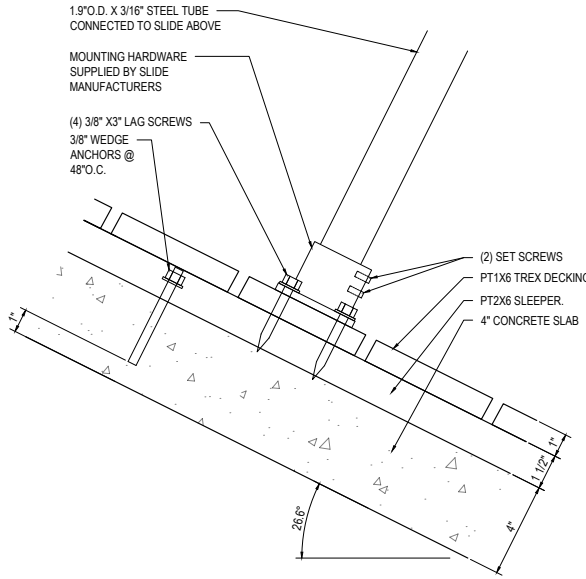
2 ELEVATION-SLIDE 1
Scale: 1/4"=1'-0"



3 ELEVATION-SLIDE 2
Scale: 1/4"=1'-0"



4 SLIDE CONNECTION TO CONCRETE
Scale: 3"=1'-0"



5 SLIDE CONNECTION TO SLOPED WOOD DECK
Scale: 3"=1'-0"

ENGINEER:
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828.712.6373

OWNER:

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NO.	REVISION	DATE
1		
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PROJECT: KALEIDEUM

TITLE: SLIDES

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

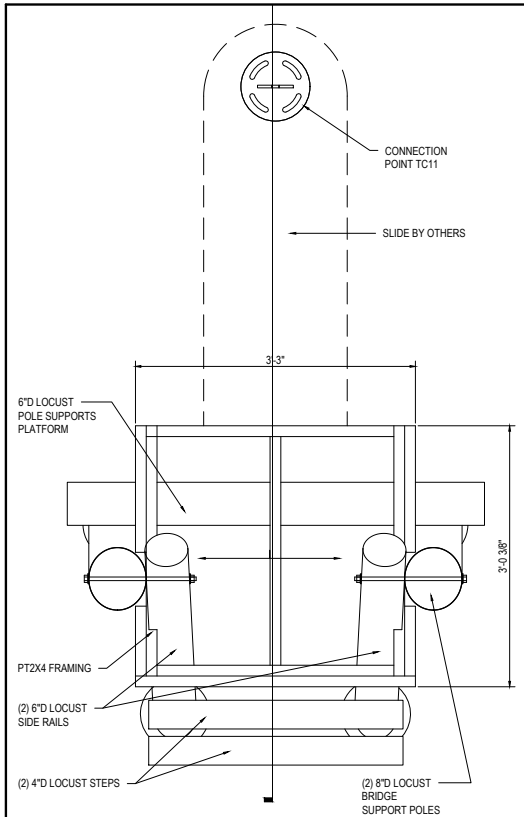
DATE: February 15, 2023

SCALE: 1/4"=1'-0"

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

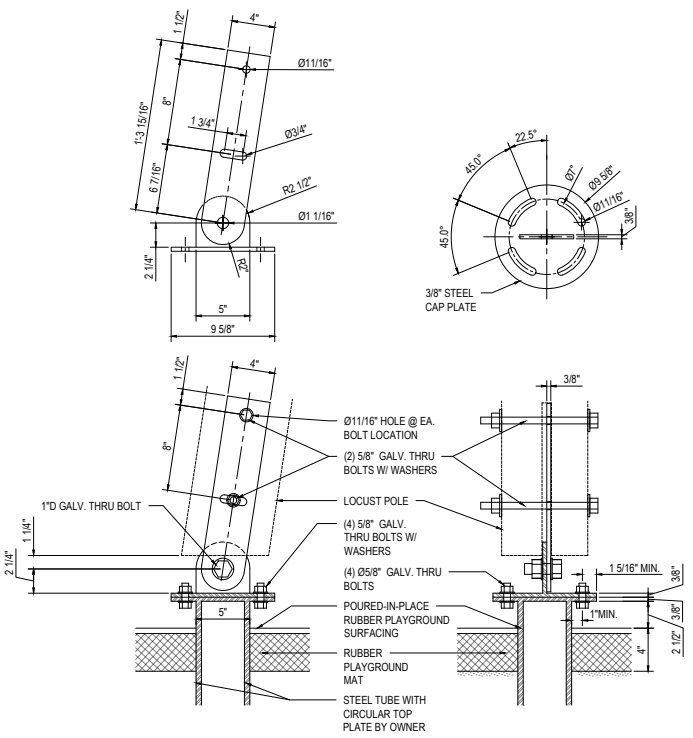
DWN BY: CM

SHEET: S8 OF: 11



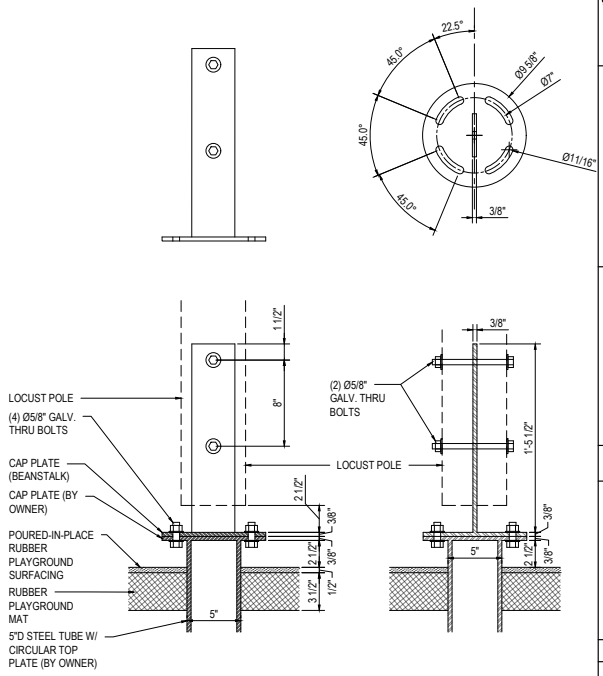
1 TODDLER SLIDE-PLAN

Scale: 1"=1'-0"



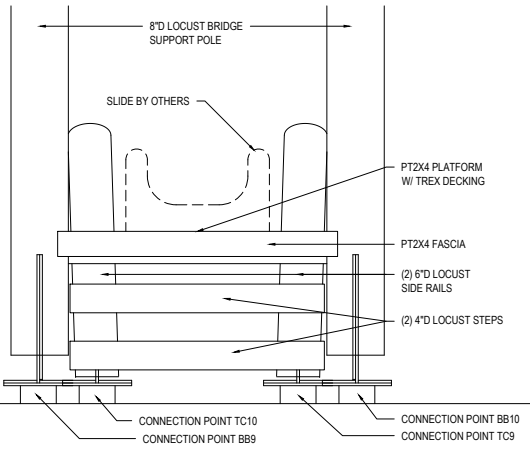
2 TYPICAL ANGLED ROOF CONNECTION DETAIL

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



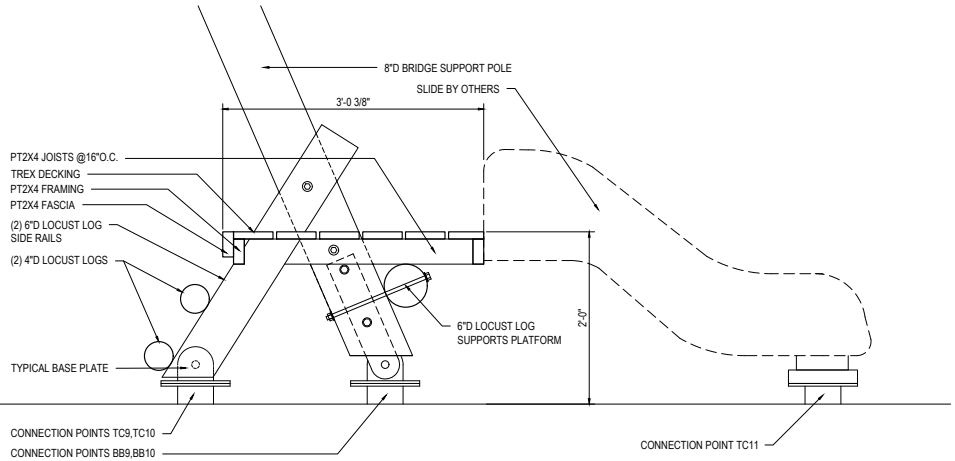
3 TYPICAL VERTICAL CONNECTION DETAIL

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



4 TODDLER SLIDE-ELEVATION

Scale: 1"=1'-0"



5 TODDLER SLIDE-SECTION

Scale: 1"=1'-0"

ENGINEER:
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D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

DATE

REVISION

NO.	1	2	3	4	5	6	7	8

PROJECT: KALEIDEUM

TITLE: TODDLER SLIDE-ROOF CONN DETAILS

DESIGNED BY: BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

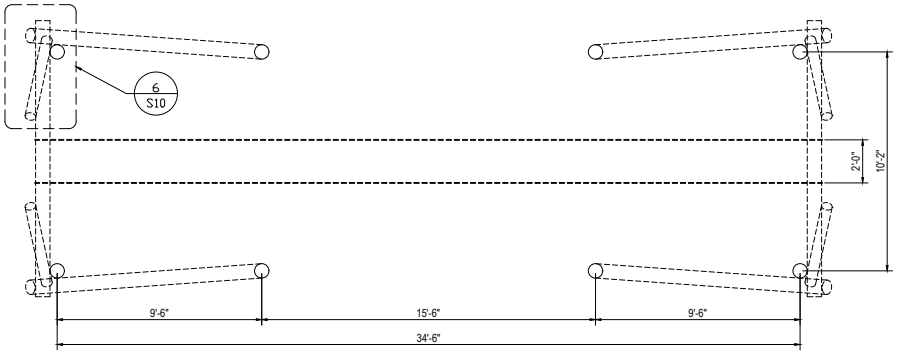
DATE: February 15, 2023

SCALE: 1/4"=1'-0"

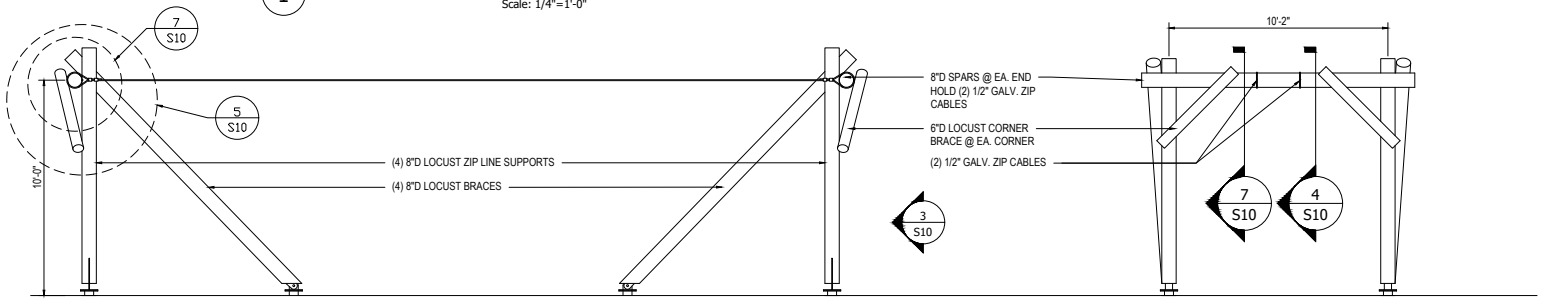
DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

SHEET: S9 OF: 11

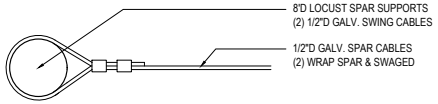


1 SLIDING SWING-PLAN
Scale: 1/4"=1'-0"

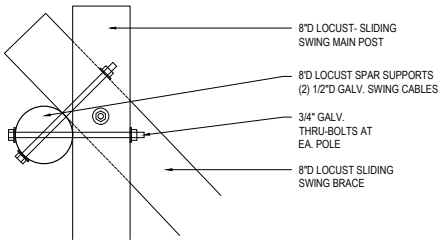


2 SLIDING SWING-SECTION
Scale: 1/4"=1'-0"

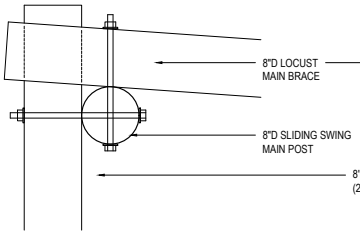
3 SLIDING SWING-END ELEVATION
Scale: 1/4"=1'-0"



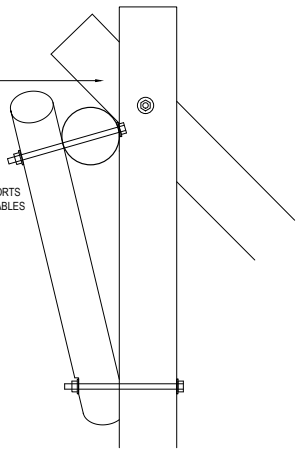
4 SPAR DETAIL @ SWING CABLES
Scale: 1"=1'-0"



5 SPAR DETAIL @ MAIN BRACE
Scale: 1"=1'-0"



6 MAIN BRACE & SPAR DETAIL
Scale: 1"=1'-0"



7 SPAR DETAIL @ CORNER BRACE
Scale: 1"=1'-0"

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D. MATT MULLEN, P.E.
ASHEVILLECIVIL@GMAIL.COM
828.712.6373

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1		
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PROJECT: KALEIDEUM

TITLE: SLIDING SWING-BRIDGE B
TOWER C CONN DETAIL

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

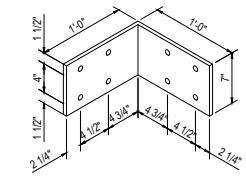
SCALE: 1/4"=1'-0"

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

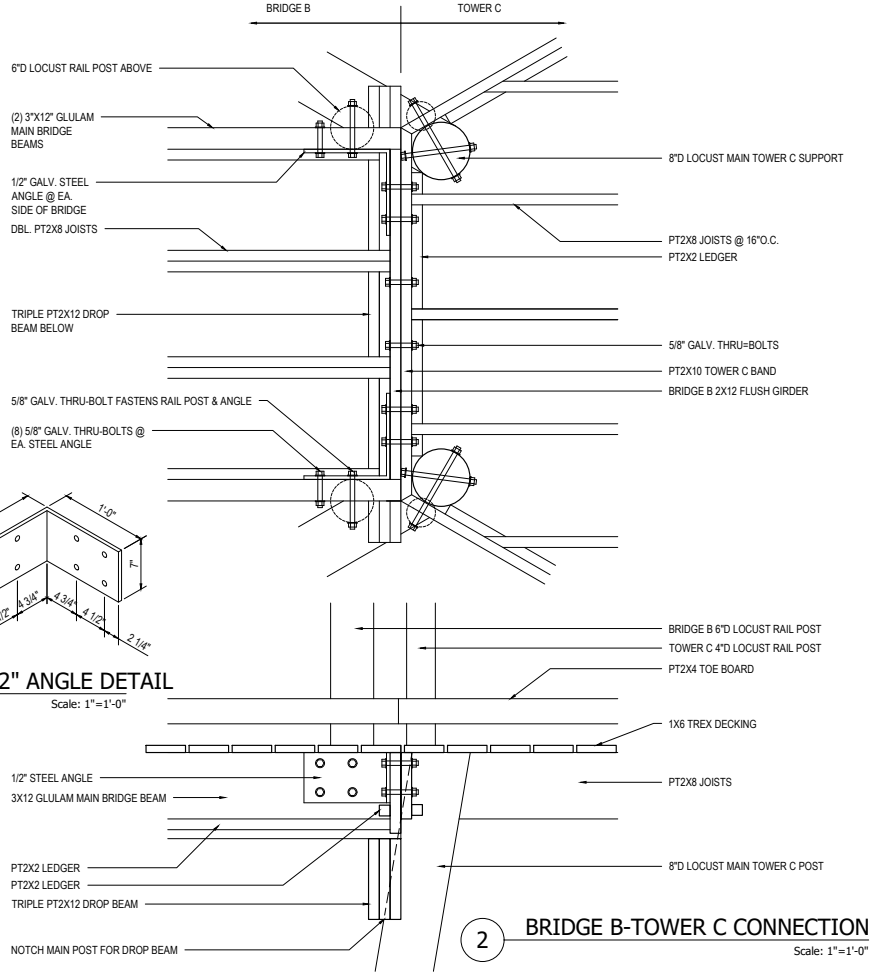
SHEET: S10

OF: 11



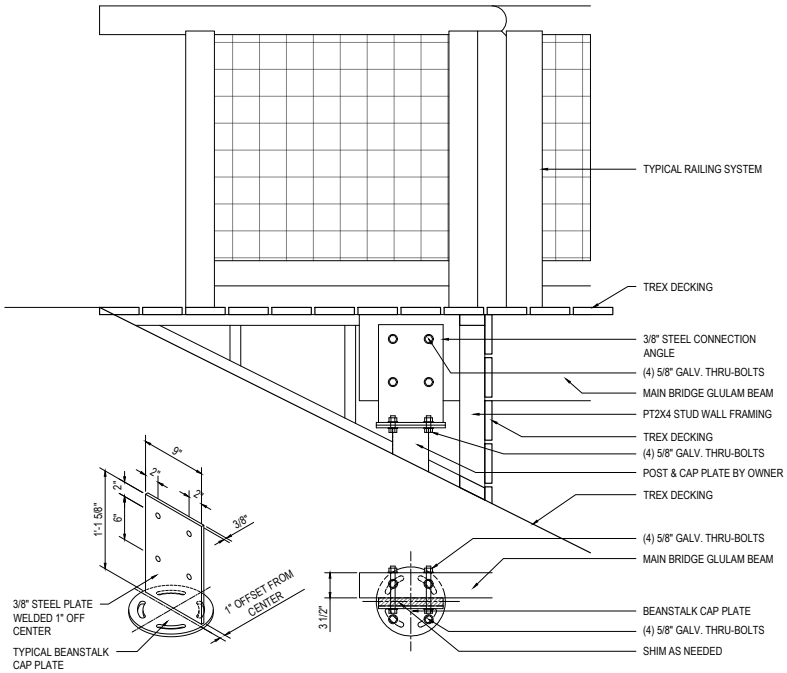
1 1/2" ANGLE DETAIL

Scale: 1"=1'-0"



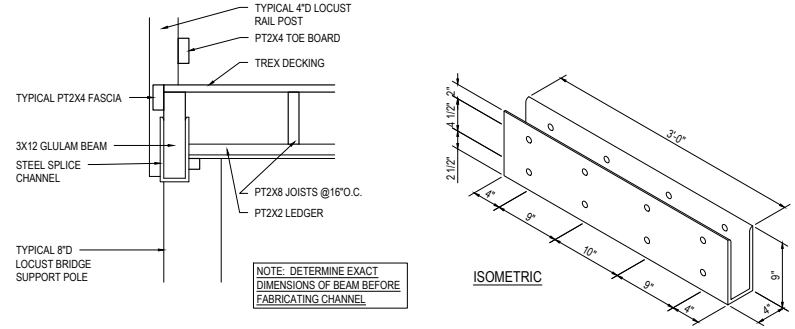
2 BRIDGE B-TOWER C CONNECTION

Scale: 1"=1'-0"



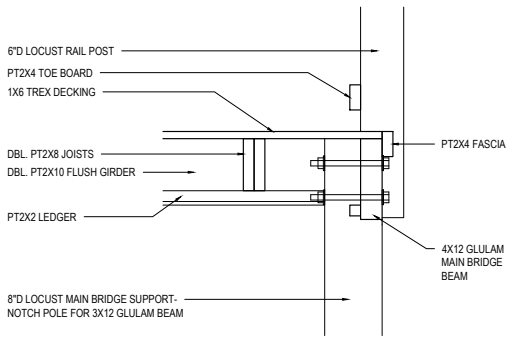
3 BRIDGE LANDING DETAIL

Scale: 1"=1'-0"



4 GLULAM SPLICE DETAIL

Scale: 1"=1'-0"



5 BRIDGE B - POST CONNECTION

Scale: 1"=1'-0"

ENGINEER:
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ASHEVILLECIVIL@GMAIL.COM
828.712.6373

OWNER:

DATE

REVISION

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PROJECT:
KALEIDEUM
BRIDGE POST CONN-GLULAM SPLICE-BRIDGE LANDING

DESIGNED BY:
BEANSTALK BUILDERS LLC
PO BOX 8357
MORGANTON, NC 28680

DATE: February 15, 2023

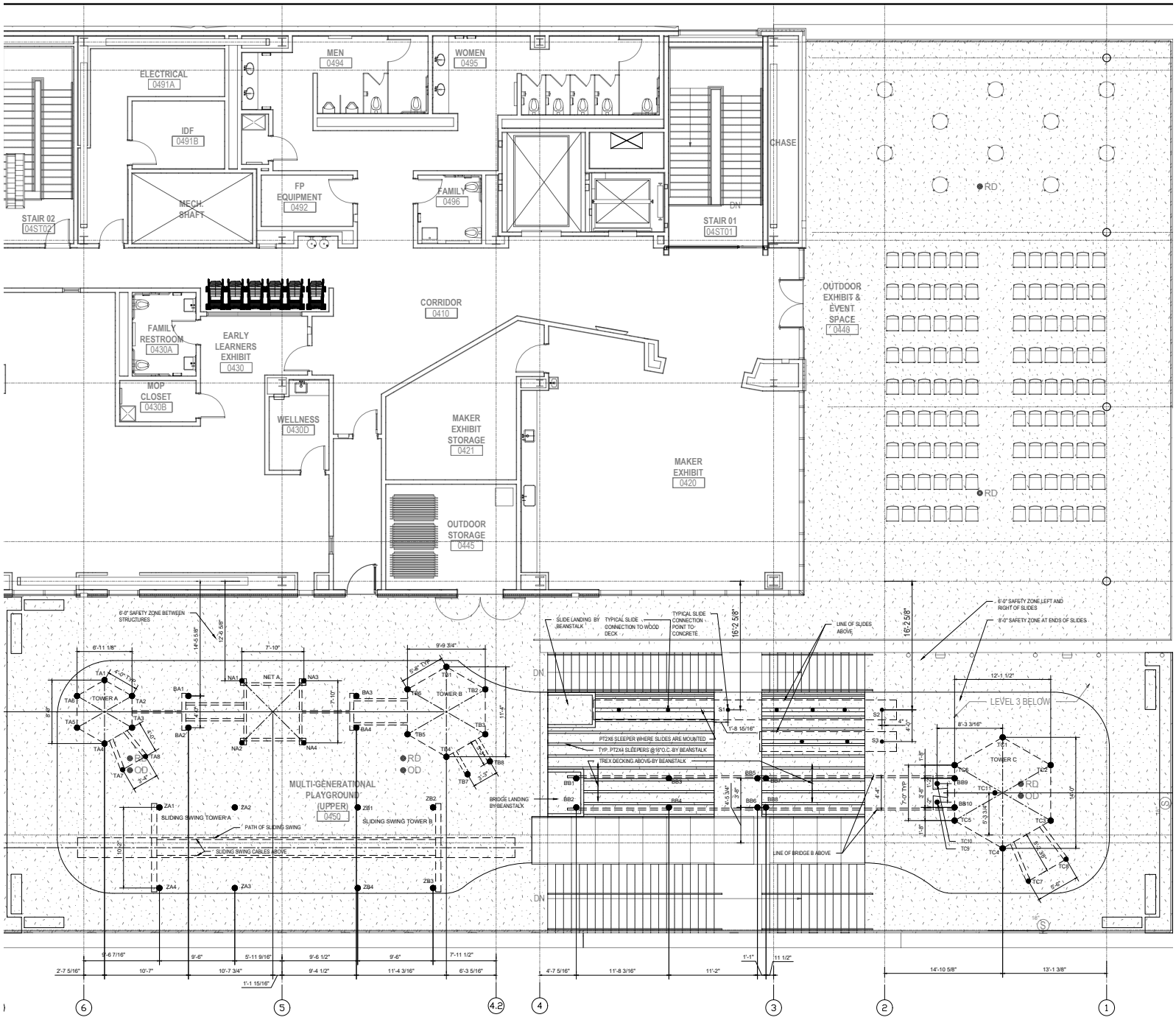
SCALE: 1/4"=1'-0"

DRAWING: Kaleideum-Beanstalk Rooftop Playground.dwg

DWN BY: CM

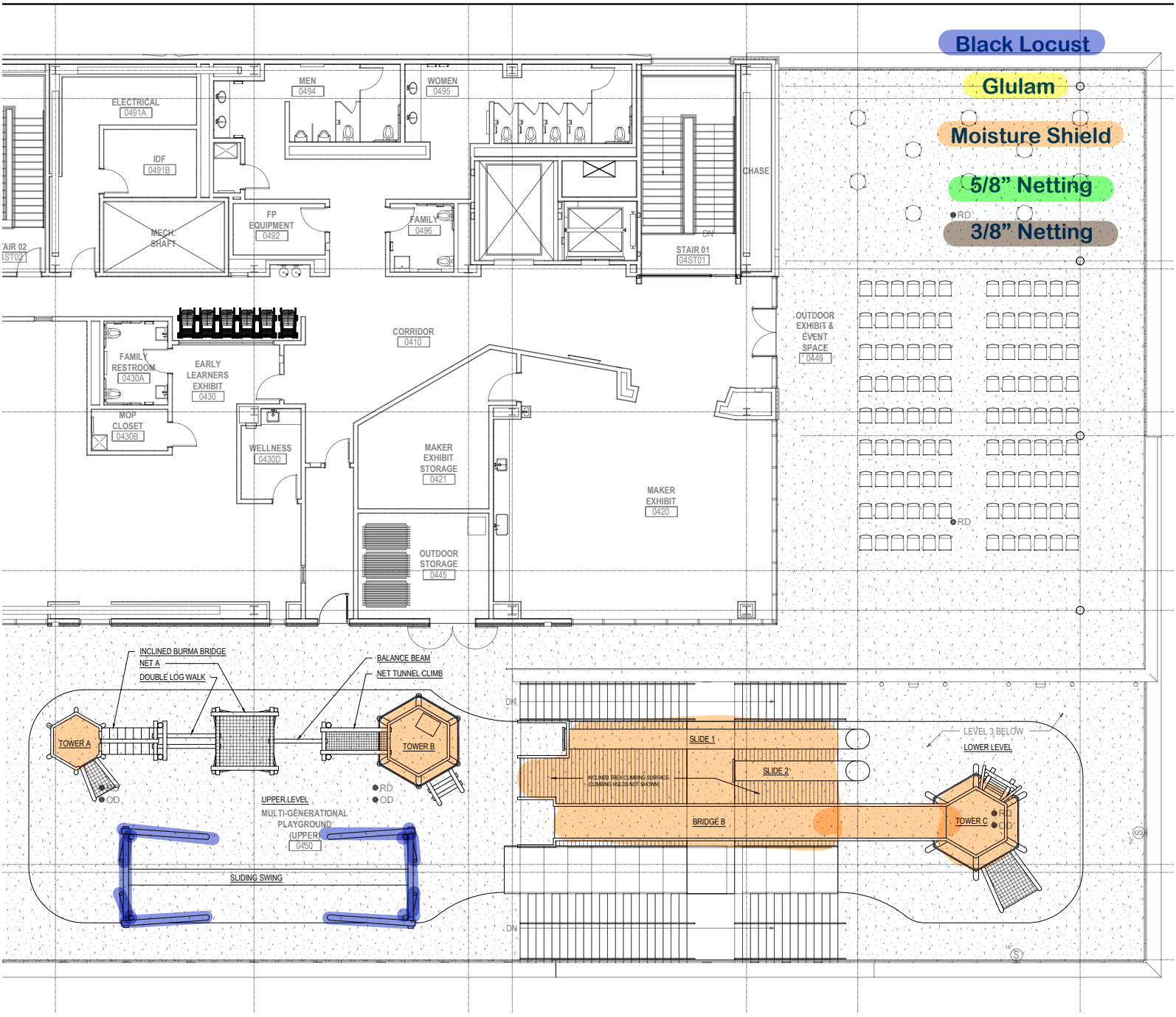
SHEET: S11 OF: 11

KALEIDEUM PLAYGROUND



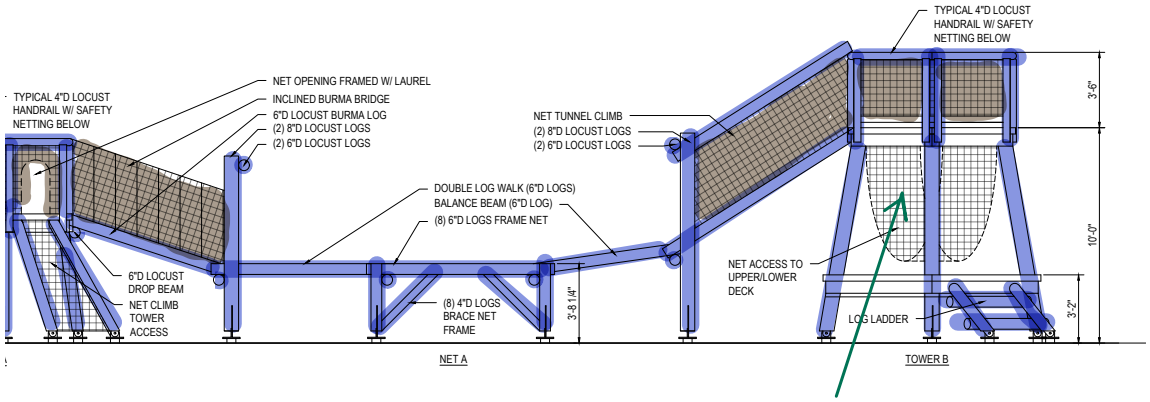
1 BEANSTALK CONNECTION POINTS

Scale: 1/8"=1'-0"



1 PLAN

Scale: 1/8"=1'-0"



TOWER A, NET A,TOWER B-ELEVATION

Scale: 1/4"=1'-0"

Black locust no net

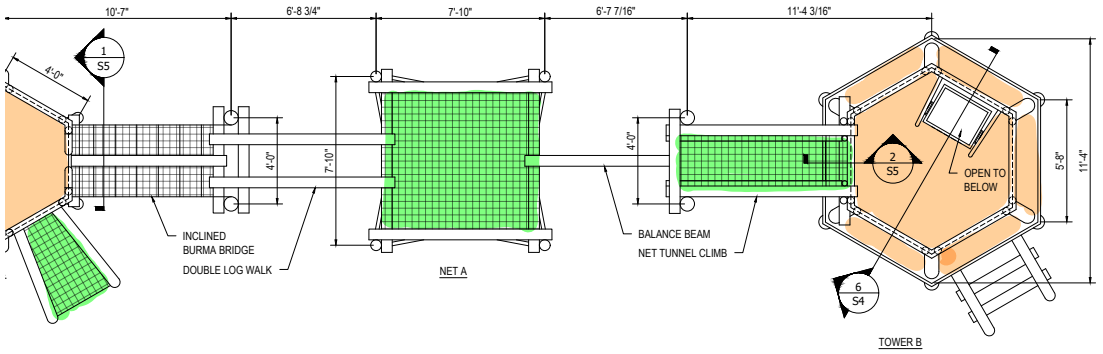
Black Locust

Glulam

Moisture Shield

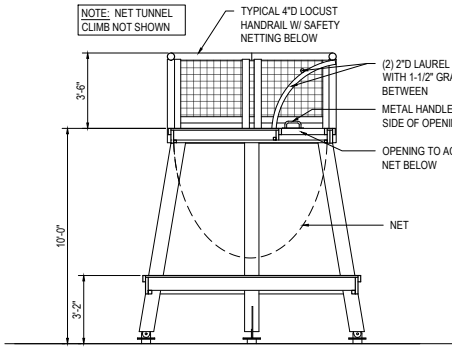
5/8" Netting

3/8" Netting



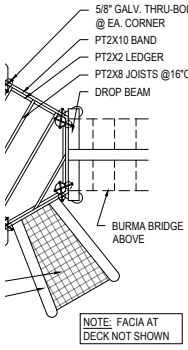
TOWER A, NET A,TOWER B-PLAN

Scale: 1/4"=1'-0"



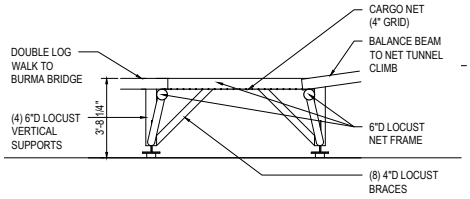
6 TOWER B-SECTION

Scale: 1/4"=1'-0"



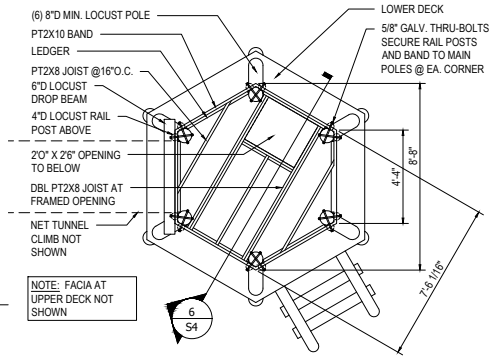
A-FRAMING PLAN

Scale: 1/4"=1'=0"



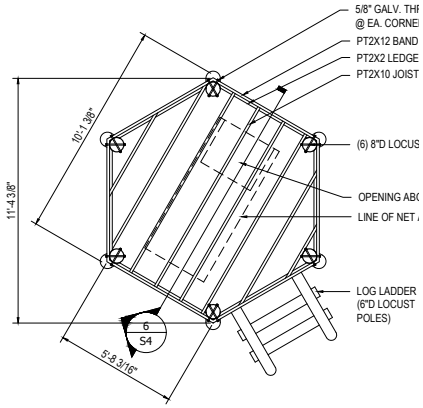
4 NET A-SECTION

Scale: 1/4"=1'-0"



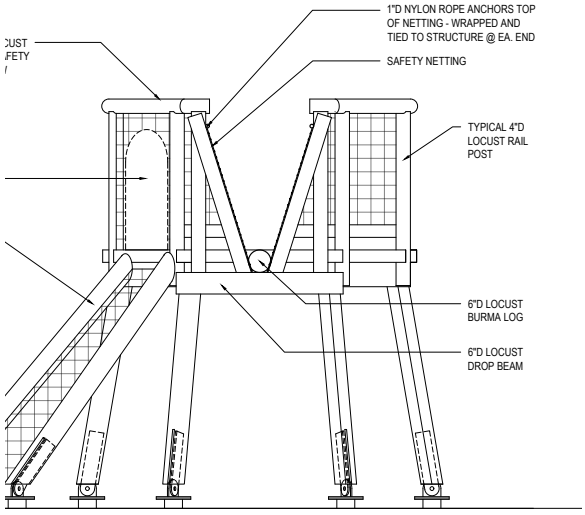
5 TOWER B-UPPER DECK FRAMING PLAN

Scale: 1/4"=1'-0"



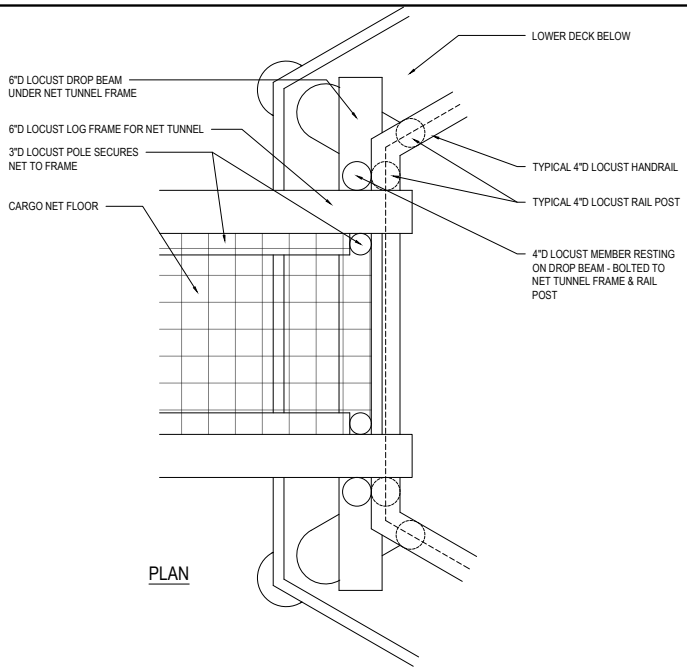
7 TOWER B-LOWER DECK FRAMING P

Scale: 1/4

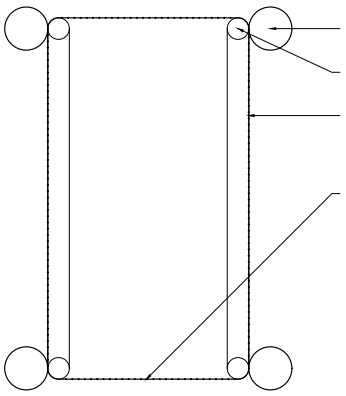


1 BURMA BRIDGE DETAIL

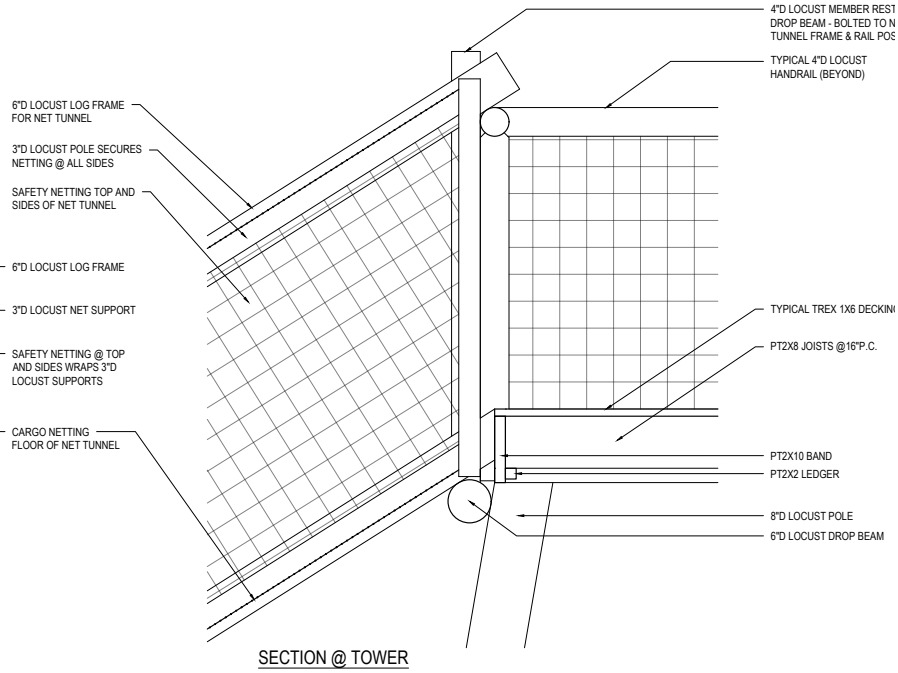
Scale: 1/2"=1'-0"



PLAN



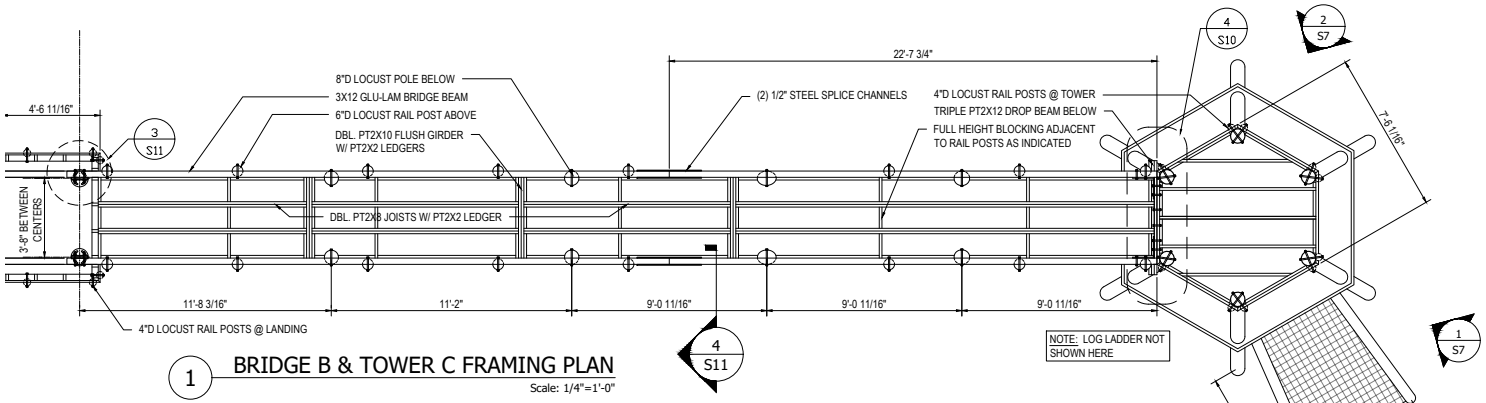
SECTION @ NET TUNNEL



SECTION @ TOWER

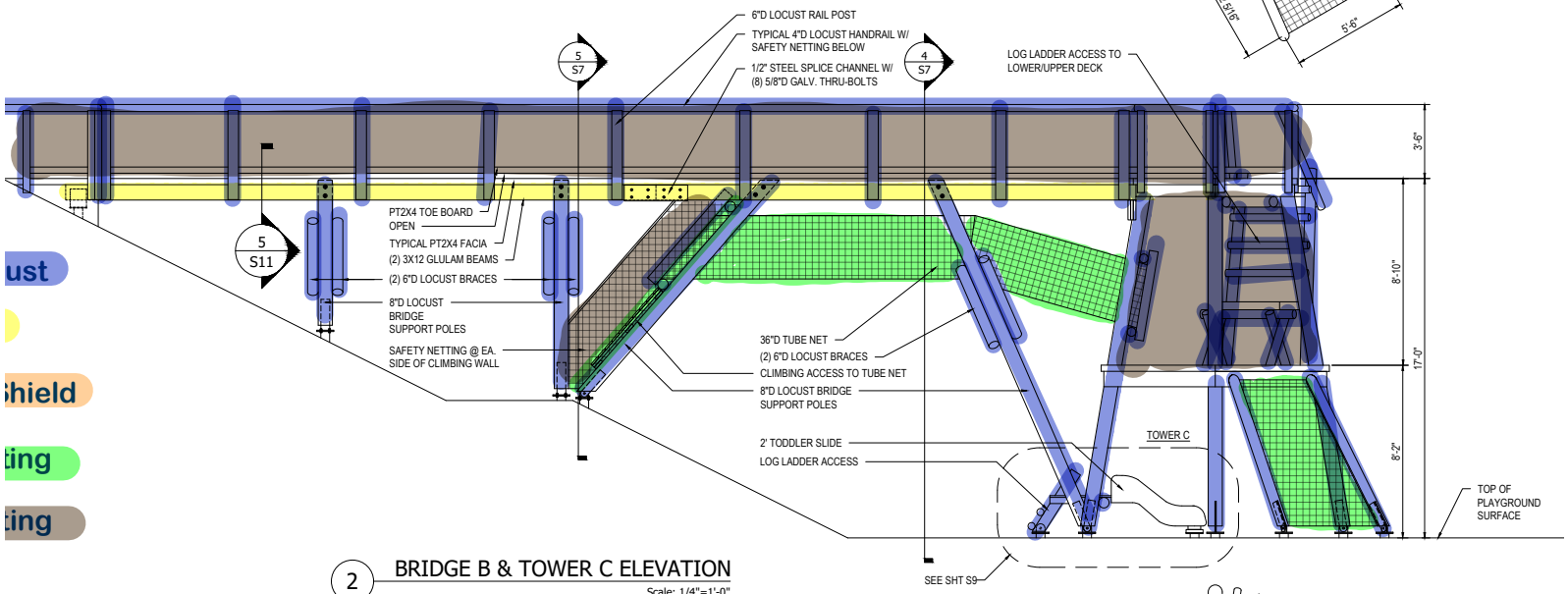
2 DETAIL @ NET TUNNEL CLIMB & TOWER B

Scale: 1"=1'-0"



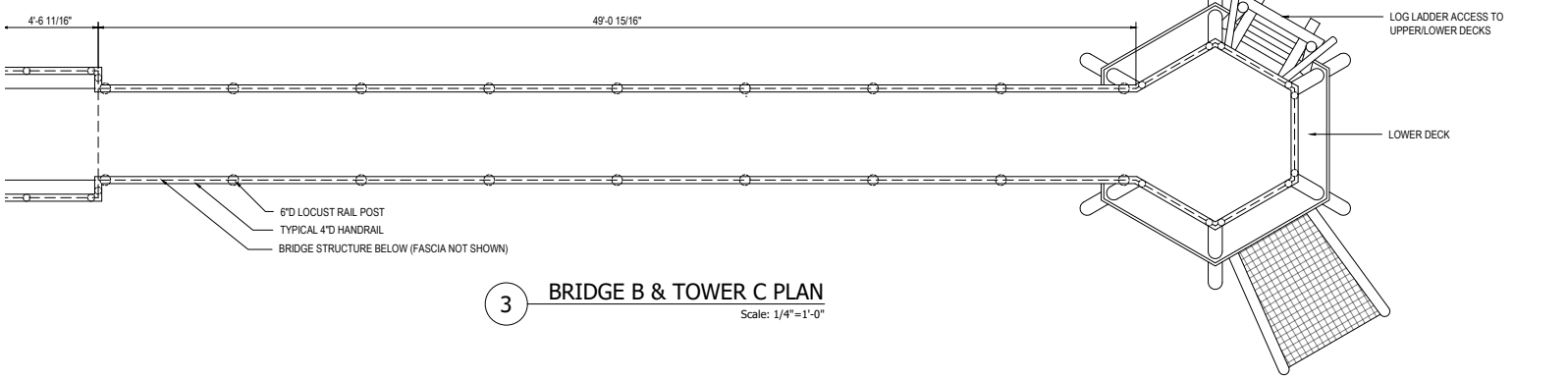
1 BRIDGE B & TOWER C FRAMING PLAN

Scale: 1/4"=1'-0"



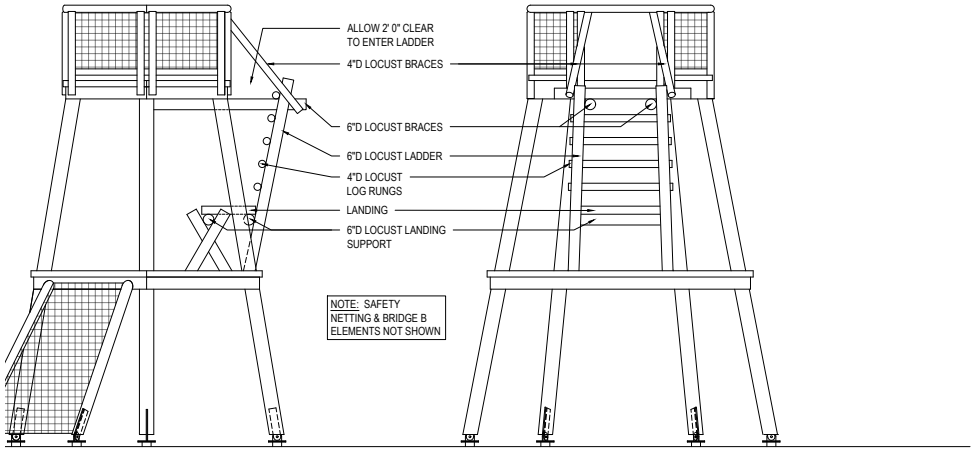
2 BRIDGE B & TOWER C ELEVATION

Scale: 1/4"=1'-0"



3 BRIDGE B & TOWER C PLAN

Scale: 1/4"=1'-0"

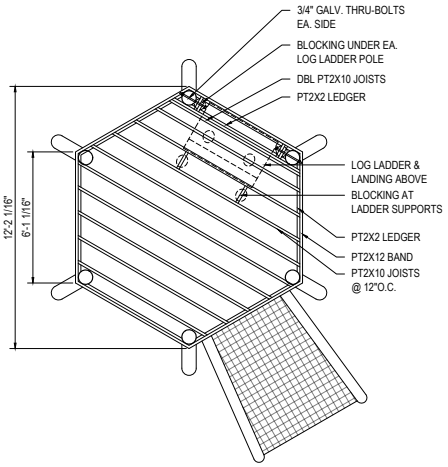


WER C-LOG LADDER SIDE ELEV.

Scale: 1/4"=1'-0"

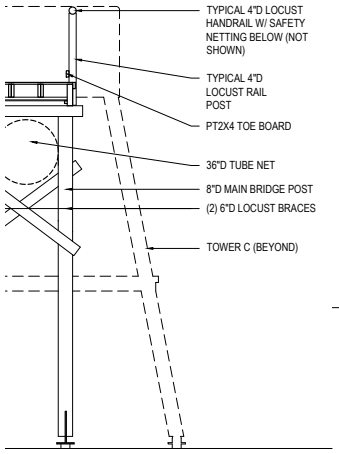
2 TOWER C-LOG LADDER FRONT ELEV.

Scale: 1/4"=1'-0"



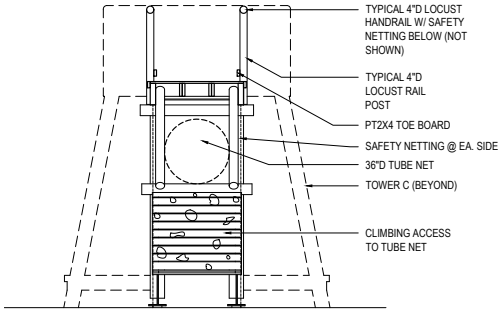
3 TOWER C-LOWER DECK FRAMING PLAN

Scale: 1/4"=1'-0"



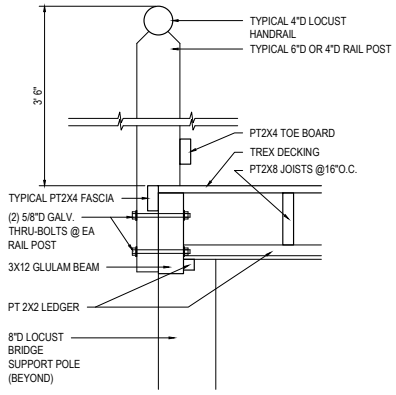
GE B-SECTION

Scale: 1/4"=1'-0"



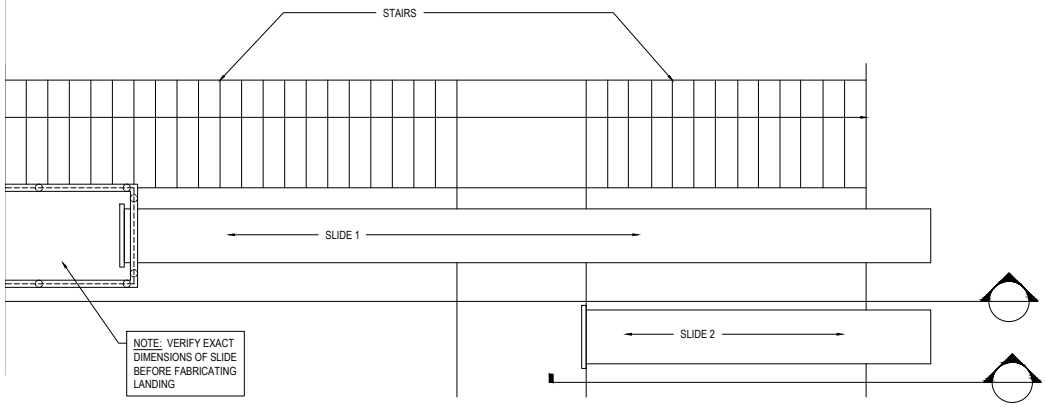
5 BRIDGE B-SECTION @ NET TUBE ENTRY

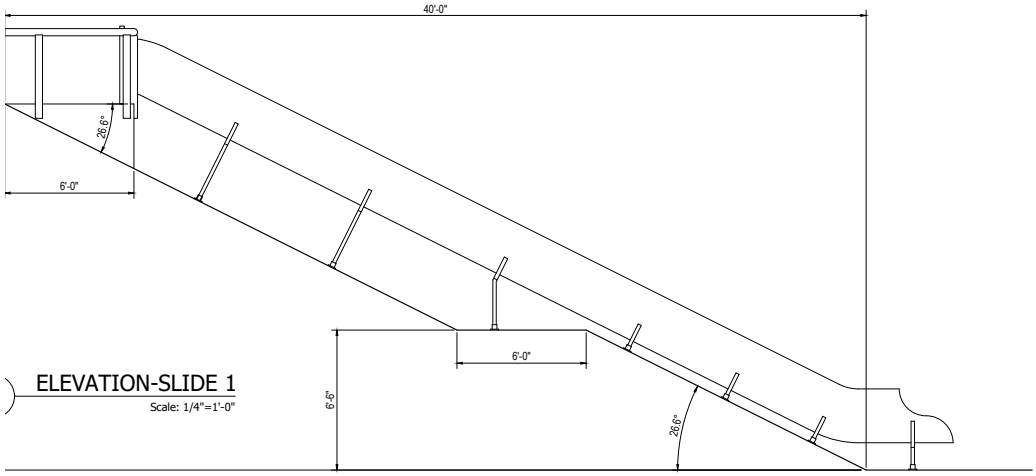
Scale: 1/4"=1'-0"



6 RAIL POST DETAIL

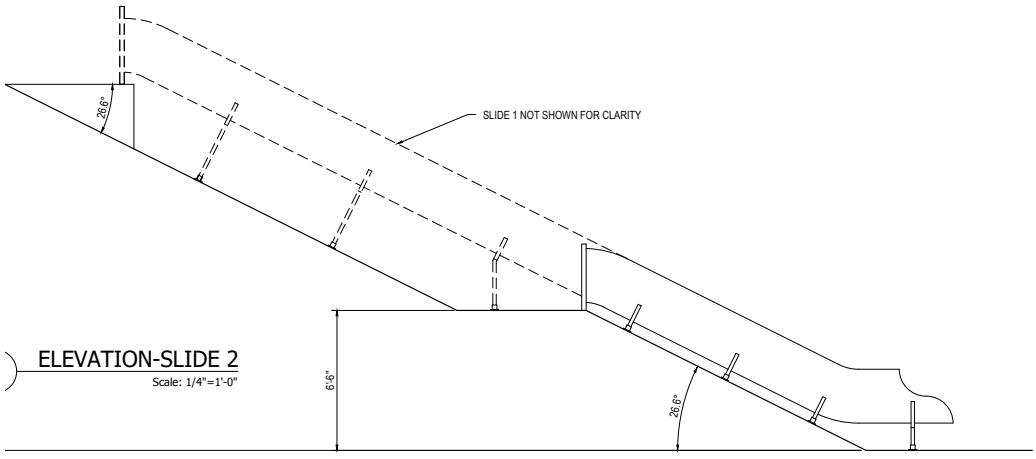
Scale: 1"=1'-0"





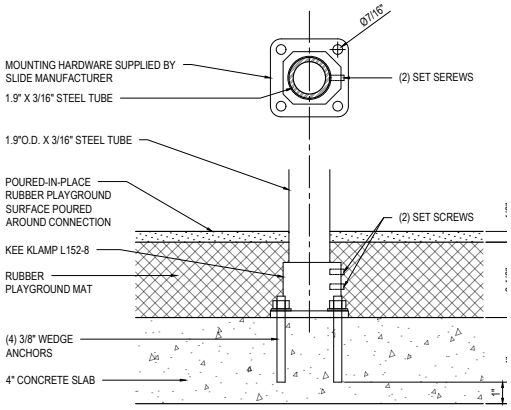
ELEVATION-SLIDE 1

Scale: 1/4"=1'-0"



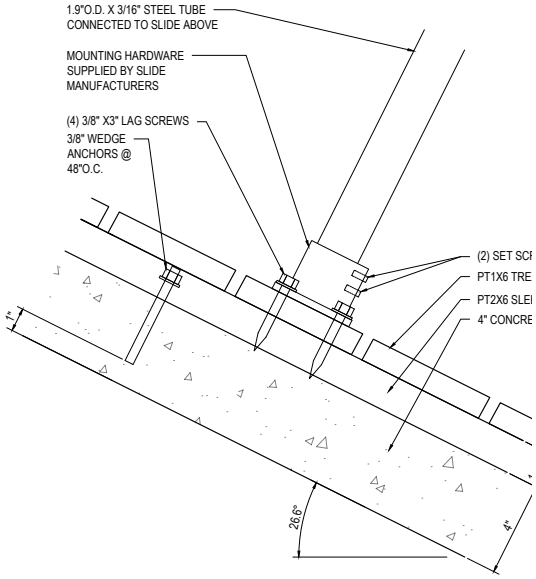
ELEVATION-SLIDE 2

Scale: 1/4"=1'-0"



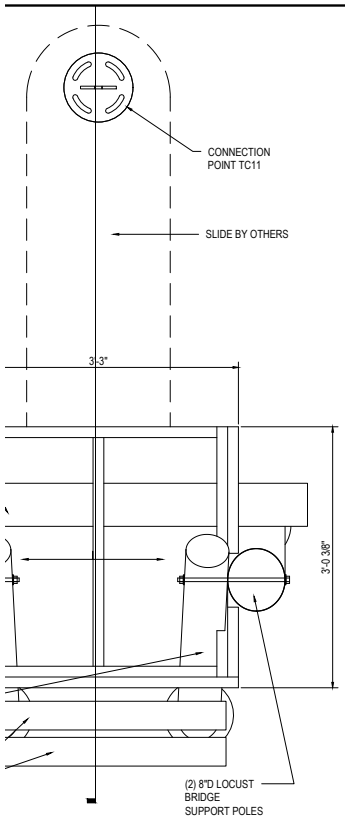
4 SLIDE CONNECTION TO CONCRETE

Scale: 3"=1'-0"



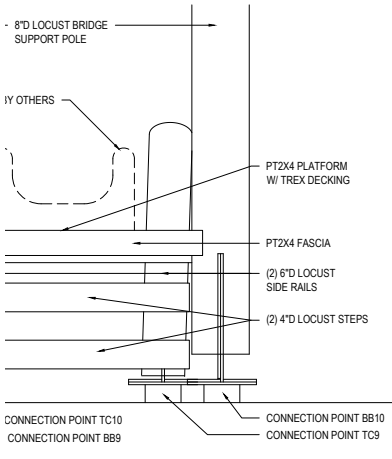
5 SLIDE CONNECTION TO SLOPED WOOD D

Scale:



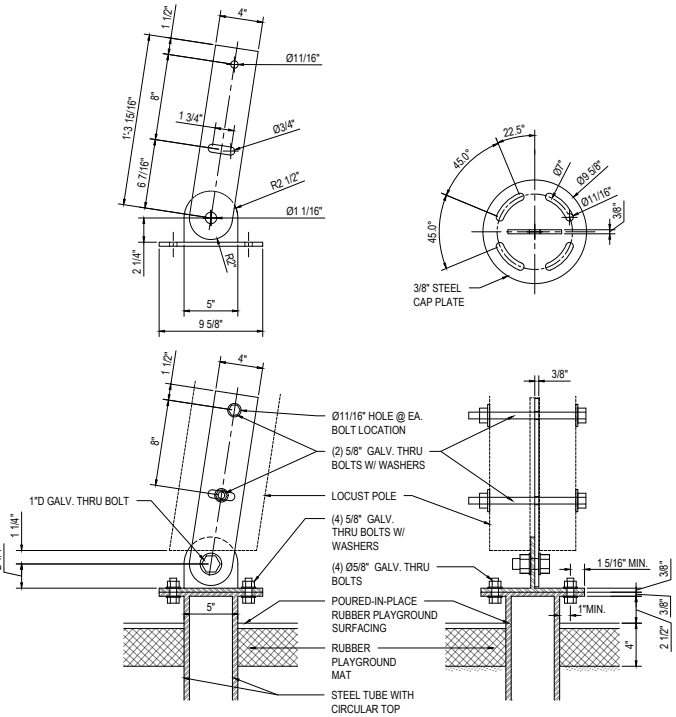
ODDLER SLIDE-PLAN

Scale: 1"=1'-0"



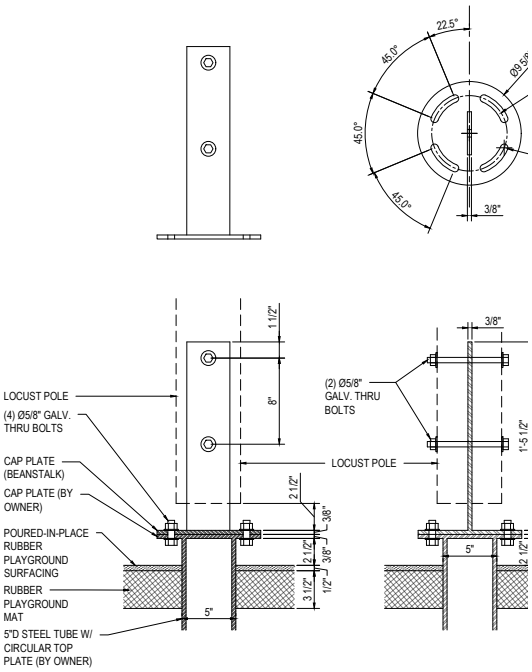
DDLER SLIDE-ELEVATION

Scale: 1"=1'-0"



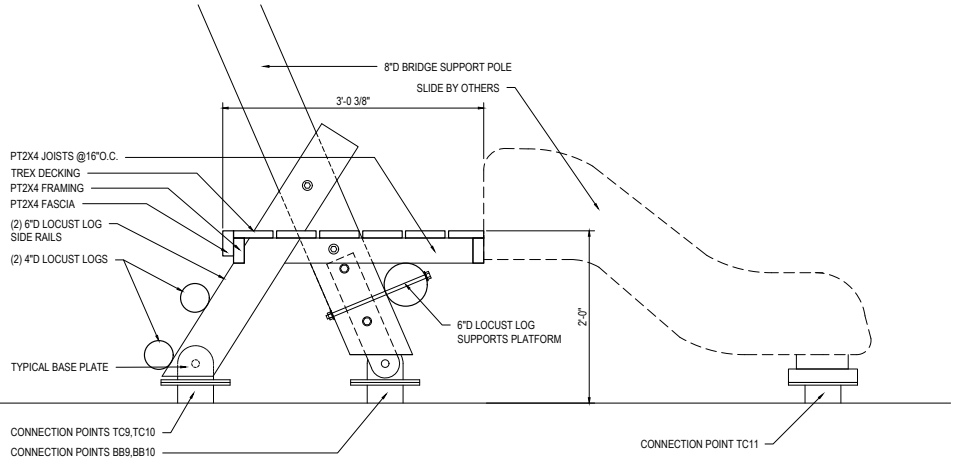
2 TYPICAL ANGLED ROOF CONNECTION DETAIL

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



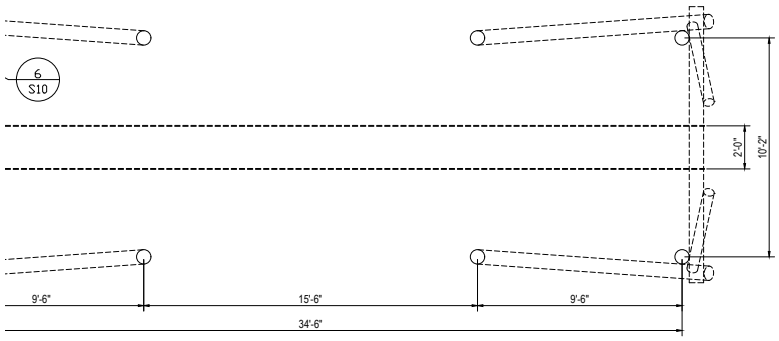
3 TYPICAL VERTICAL CONNECTION DETAIL

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



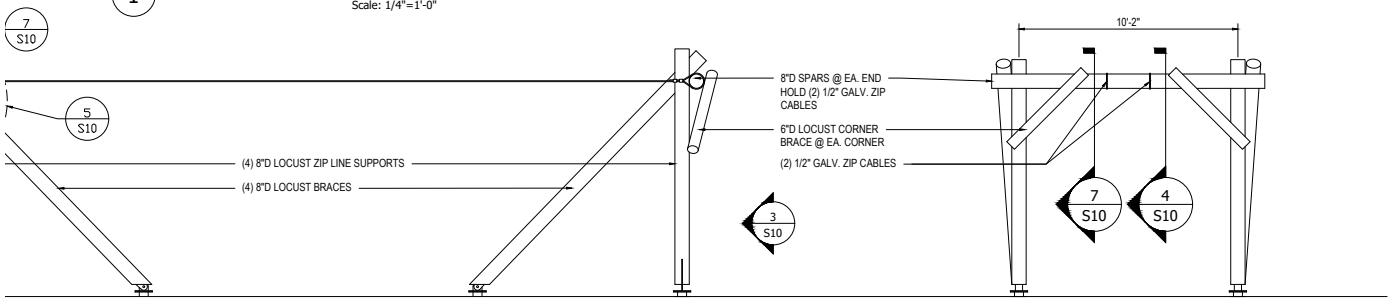
5 TODDLER SLIDE-SECTION

Scale: 1"=1'-0"



1 SLIDING SWING-PLAN

Scale: 1/4"=1'-0"

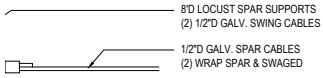


2 SLIDING SWING-SECTION

Scale: 1/4"=1'-0"

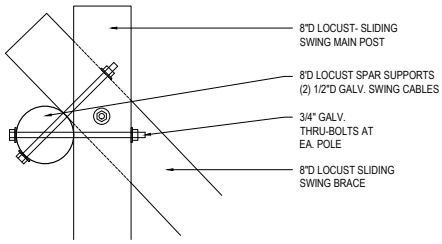
3 SLIDING SWING-END ELEVATION

Scale: 1/4"=1'-0"



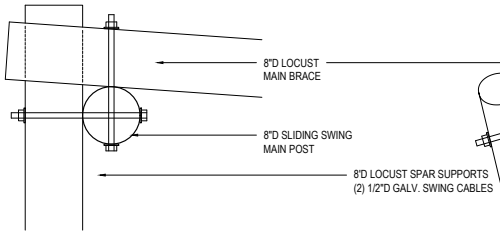
DETAIL @ SWING CABLES

Scale: 1"=1'-0"



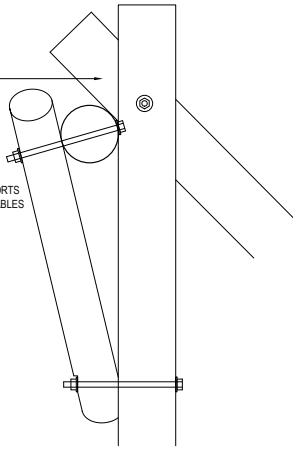
5 SPAR DETAIL @ MAIN BRACE

Scale: 1"=1'-0"



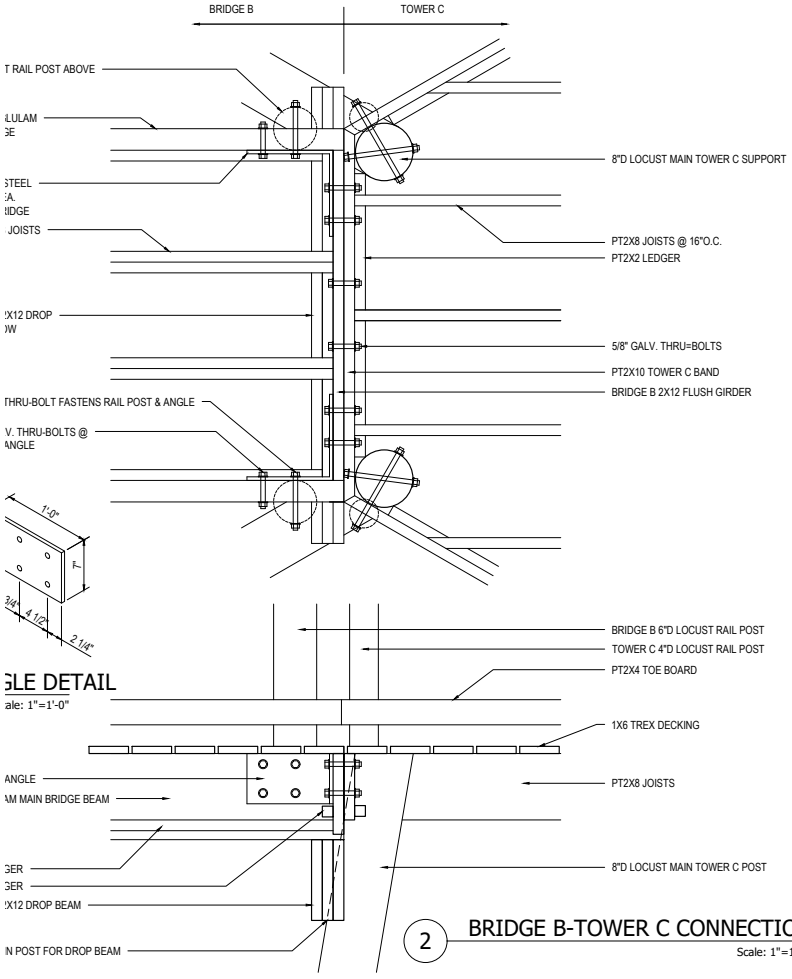
6 MAIN BRACE & SPAR DETAIL

Scale: 1"=1'-0"



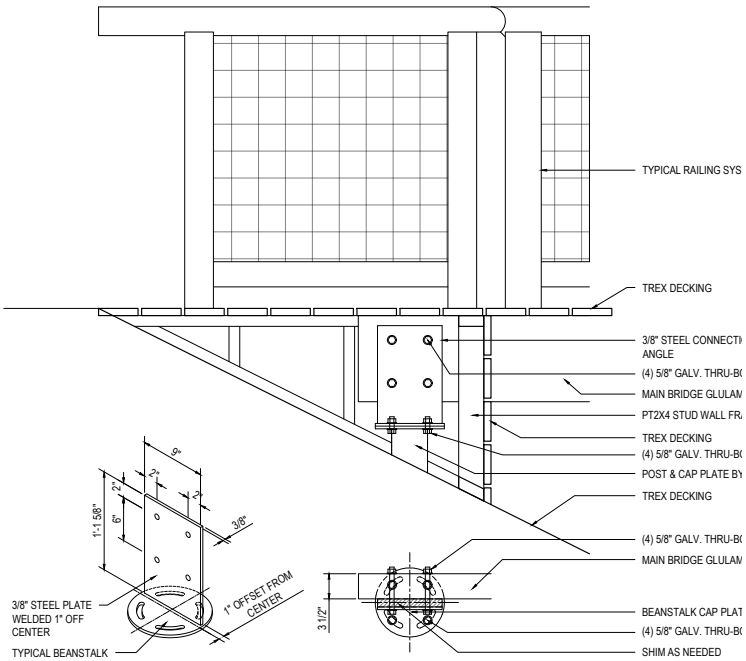
7 SPAR DETAIL @ CORNER BRACI

Scale: 1"=1'-(

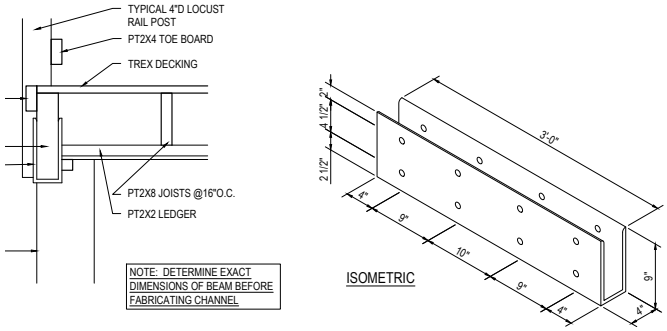


GLE DETAIL
ale: 1"=1'-0"

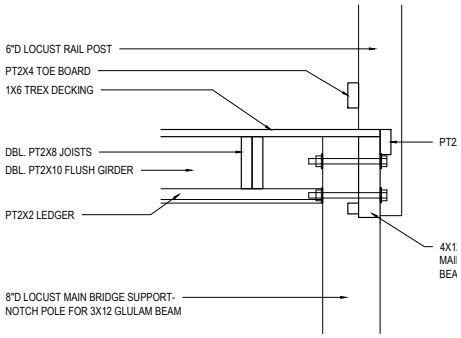
2 BRIDGE B-TOWER C CONNECTION
Scale: 1"=1'-0"



3 BRIDGE LANDING DETAIL
Scale: 1"=1'-0"



4 GLULAM SPLICE DETAIL
Scale: 1"=1'-0"



5 BRIDGE B - POST CONNECTION
Scale: 1"=1'-0"

COMMERCIAL TESTING COMPANY
1215 South Hamilton Street • Dalton, Georgia 30720
Telephone (706) 278–3935 • Facsimile (706) 278–3936

Standard Method of Test for
Surface Burning Characteristics of Building Materials

ASTM E84–16

Black Locust Decking – Standard

Report Number 17–08070

Test Number 5064–4312
August 3, 2017

Robi Decking
Atlanta, Georgia

Commercial Testing Company

(Authorized Signature)

TESTED TO BE SURE®
Since 1974

INTRODUCTION

This report is a presentation of results of a surface flammability test on a material submitted by Robi Decking, Atlanta, Georgia.

The test was conducted in accordance with the ASTM International fire-test-response standard E84–16, *Surface Burning Characteristics of Building Materials*, sometimes referred to as the Steiner tunnel test. ASTM E84 is an American National Standard (ANSI) and has been approved for use by agencies of the Department of Defense. The ASTM E84 test method is the technical equivalent of UL No. 723. The test is applicable to exposed interior surfaces such as walls and ceilings. The test is conducted with the specimen in the ceiling position with the surface to be evaluated face down toward the ignition source. Thus, specimens shall either be self-supporting by its own structural quality, held in place by added supports along the test surface, or secured from the back side.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

PURPOSE

The purpose of the test is to provide only the comparative measurements of surface flame spread and smoke development of materials with that of select grade red oak and fiber–reinforced cement board, Grade II, under specific fire exposure conditions. The test exposes a nominal 24-foot long by 20-inch wide test specimen to a controlled air flow and flaming fire adjusted to spread the flame along the entire length of a red oak specimen in 5½ minutes. During the 10-minute test duration, flamespread over the specimen surface and density of the resulting smoke are measured and recorded. Test results are calculated relative to red oak, which has an arbitrary rating of 100, and fiber–reinforced cement board, Grade II, which has a rating of 0.

The test results are expressed as Flame Spread Index and Smoke Developed Index. The Flame Spread Index is defined in ASTM E176 as "a number or classification indicating a comparative measure derived from observations made during the progress of the boundary of a zone of flame under defined test conditions." The Smoke Developed Index, a term specific to ASTM E84, is defined as "a number or classification indicating a comparative measure derived from smoke obscuration data collected during the test for surface burning characteristics." There is not necessarily a relationship between the two measurements.

The method does not provide for measurement of heat transmission through the surface tested, the effect of aggravated flame spread behavior of an assembly resulting from the proximity of combustible walls and ceilings, or classifying a material as noncombustible solely by means of a Flame Spread Index.

The zero reference and other parameters critical to furnace operation are verified on the day of the test by conducting a 10–minute test using 1/4–inch fiber–reinforced cement board, Grade II. Periodic tests using NOFMA certified 23/32–inch select grade red oak flooring provide data for the 100 reference.

TEST SAMPLE

The test sample, selected by the client, was identified as **Black Locust Decking – Standard**, 1-inch thick wood decking planks having a width of 5-1/2 inches. The planks were assembled into three decks, each measuring 22 inches wide by 96 inches in length. The decks were assembled as specified in ASTM E2579, *Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics*, Section 8.2, which describes the preparation of Solid Boards and Lumber. Four planks were used to assemble each deck, without joints, using steel batten strips 1 inch wide by 3/16-inch thick. The battens were attached 12 inches from the ends of each deck using 1-inch long Number 10 wood screws, two per board. After assembly, the decks were transferred to storage racks and conditioned 17 days in an atmosphere with the temperature maintained at 71 ± 2°F and the relative humidity at 50 ± 5 percent. The moisture content measured on the day of the test was 27.8 percent. For testing, the panels were placed end–to–end on the ledges of the tunnel furnace and the test conducted with no auxiliary support mechanism.

TEST RESULTS

The test results, calculated on the basis of observed flame propagation and the integrated area under the recorded smoke density curve, are presented below. The Flame Spread Index obtained in E84 is rounded to the nearest number divisible by five. Smoke Developed Indices are rounded to the nearest number divisible by five unless the Index is greater than 200. In that case, the Smoke Developed Index is rounded to the nearest 50 points. The flame spread and smoke development data are presented graphically at the end of this report.

Test Specimen	Flame Spread Index	Smoke Developed Index
Fiber-Reinforced Cement Board, Grade II	0	0
Red Oak Flooring	100	100
Black Locust Decking – Standard	**25**	**5**

OBSERVATIONS

Specimen ignition over the burners occurred at 0.97 minute. Surface flame spread was observed to a maximum distance of 7.29 feet beyond the zero point at 9.60 minutes. The maximum temperature recorded during the test was 616°F. For information purposes, the actual (unrounded) Flame Spread and Smoke Developed Indices were 24.1 and 5.8 respectively.

CLASSIFICATION

The Flame Spread Index and Smoke Developed Index values obtained by ASTM E84 tests are frequently used by code officials and regulatory agencies in the acceptance of interior finish materials for various applications. The most widely accepted classification system is described in the National Fire Protection Association publication NFPA 101 *Life Safety Code*, where:

Class A	0 – 25 Flame Spread Index	0 – 450 Smoke Developed Index
Class B	26 – 75 Flame Spread Index	0 – 450 Smoke Developed Index
Class C	76 – 200 Flame Spread Index	0 – 450 Smoke Developed Index

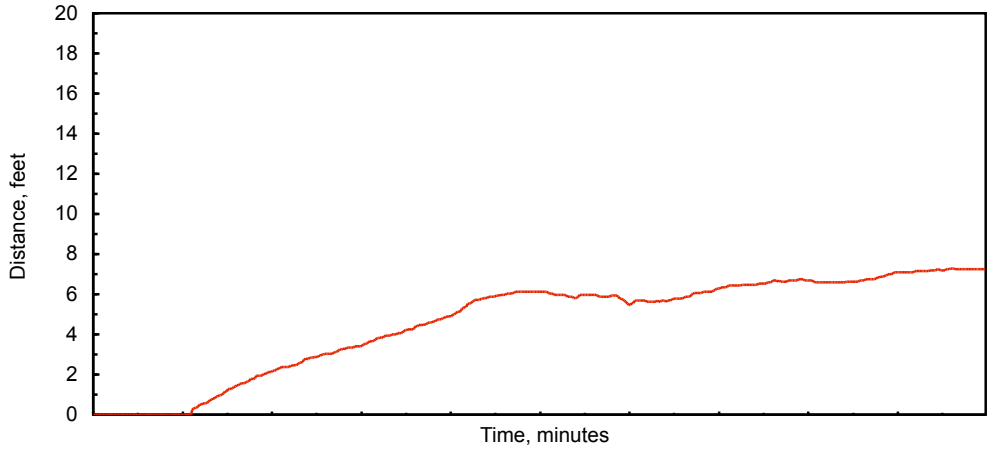
Class A, B, and C correspond to Type I, II, and III respectively in other codes. They do not preclude a material being otherwise classified by the authority of jurisdiction.

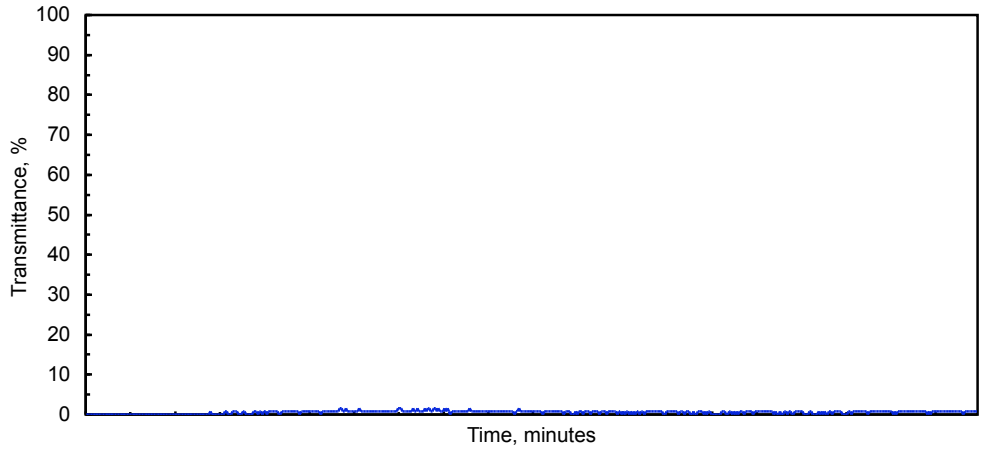
ASTM E 84 TEST DATA

Client: Robi Decking
Test Number: 5064-4312
Material Tested: Black Locust Decking - Standard
Date: August 3, 2017

Test Results:

Time to Ignition	=	00.97 minutes
Maximum Flamespread Distance	=	07.29 feet
Time to Maximum Spread	=	09.60 minutes
Flame Spread Index	=	25
Smoke Developed Index	=	5





MoistureShield Deck Boards and Stair Treads

MoistureShield, Inc.

Initial Acceptance: June 19, 2017 **Expiration:** June 18, 2024

Revision: June17, 2022

TYPE OF ACCEPTANCE **Product Material – Wood and Plastics**
CSI Specification Division: 06 50 00 (Structural Plastic) and 06 53 00 (Plastic Decking)

MANUFACTURER IDENTIFICATION:

MoistureShield, Inc
810 Jefferson Street
Springdale, AR 72764
1-479-756-7400
www.moistureshield.com

EVALUATION REPORT SUBJECT: Deck Boards and Stair Treads for Exterior Applications
Installation on construction complying with the International Residential Code® (IRC®) or with the International Building Code® (IBC®).

DESCRIPTION OF BUILDING COMPONENTS:

A. Deck Boards

MoistureShield, Inc., deck boards are wood thermoplastic composite lumber product consisting of plastic, wood filler plus additives and color. The product specifications are listed in the approved quality control manual. MoistureShield, Inc., deck board components are manufactured in several colors by the mono-extrusion process (under series name ***Vision***, ***Vantage***, ***Vue***, ***ModernView***, and ***LifeCycle***) or the co-extrusion process with capping covering three sides of the deck board (under series name ***Elevate*** and ***Meridian***).

1. **Deck Boards**: Mono-extrusion production method. See attached drawings in **Table 1.A.1**
2. **Deck Boards**: Co-extrusion production method. See attached drawings in **Table 1.A.1**
3. MoistureShield, Inc., deck boards can be used as stair treads. When deck boards are used as stair treads, they must be installed perpendicular to the supporting framing. Deck boards and stair treads must be installed over at least two spans. The decking and stair treads must be installed with a minimum gap of 3/16 inch between parallel boards for drainage and decking must be installed with a minimum clearance of 1/8 inch at each end of the board. See manufacturer's installation instructions noted item 4 below.
4. For additional decking installation details see manufacturer's published installation instructions at *https://www.moistureshield.com/support/installation-instructions/*

APPLICABLE CODES:

- 2015, 2018, and 2021 International Building Code® (IBC®)
- 2015, 2018, and 2021 International Residential Code® (IRC®)

APPLICABLE CHARACTERISTICS REVIEWED:

B. Deck Board(s) – See Table 1 below for a list of the descriptions of the deck boards reviewed.

1. Deck Board: Structural Performance

(a) The deck boards have been reviewed for uniform load, maximum span and deck board direction when installed on support framing members. See attached Table 1.

(b) The deck boards have been reviewed for wind uplift resistance and have an uplift load rating when installed as indicated in Table 1 in this Report.

(c) The deck boards used as stair treads meet the code-prescribed load requirements including the concentrated load of 300 lbf when installed in accordance with the manufacturer's installation instructions and Table 1 in this Report.

(d) Review of the structural design for code compliance of supporting members has not been evaluated and is not a part of this Report.

2. Deck Board: Fastening

(a) The deck boards must be fastened to the structural support members in accordance with the manufacturer's installation instructions and Table 1 of this Report. When manufacturer's installation instructions differ from this Report, this Report governs.

(b) When deck boards are used as stair treads, they must be installed in accordance with the manufacturer's installation instructions and Table 1 in this Report. When the manufacturer's installation instructions differ from this Report, this Report governs.

3. Deck Board Durability: Temperature

(a) The deck boards have been reviewed for the temperature range of -20 to 125 ºF (-29 to 52 ºC).

4. Deck Board Flame Spread Index:

(a) The flame spread rating for the deck boards described in this Report was less than 200 when tested with ASTM E84 *Standard Test Method for Surface Burning Characteristics of Building Materials.*

5. Deck Board Decay Resistance:

(a) The deck boards reviewed for this Report have been deemed comparable to naturally durable wood for resistance to fungal decay.

6. Deck Board Termite Resistance:

(a) The deck boards reviewed for this Report have been deemed comparable to preservative-treated wood for resistance to termite attack.

7. UV Testing:

(a) The UV testing was conducted, and an appropriate adjustment factor was applied, in accordance with ASTM D7032 *Standard for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails).*

APPLICABLE USES:

MoistureShield, Inc., deck boards evaluated in this Report are limited to exterior applications for balconies, porches, stair treads, walking surfaces and decks.

LIMITATIONS OF ACCEPTANCE:

MoistureShield, Inc., deck boards described in this Report comply with those codes listed in the Applicable Codes section above and are subject to the following conditions:

1. The deck board products must be limited to Type V-B (IBC) and residential construction in accordance with the IRC for exterior use as deck boards for balconies, porches, decks and stair treads.

2. Installation of the deck boards must comply with this Report, the manufacturer's published installation instructions (see section A-4 above), and the applicable codes. When deck board manufacturer's installation instructions differ from this Report, this Report governs.
3. The fasteners described in this Report have been evaluated for the installation of the MoistureShield, Inc., deck boards only. Compatibility of the fasteners to the treated supporting construction has not been evaluated.
4. MoistureShield, Inc., deck boards indicated in this Report must be fastened to the supporting construction as indicated in the manufacturer's installation manual and as outlined in this Report. When deck board manufacturer's fastening instructions differ from this Report, this Report governs.
5. When required, the structural deck board layout must be designed by a professional and submitted to the authority having jurisdiction for final acceptance.
6. MoistureShield, Inc., deck boards have not been evaluated as a member of a fire-resistance-rated assembly.
7. MoistureShield, Inc., has a third-party inspection program provided by PFS TECO.

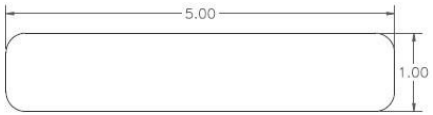
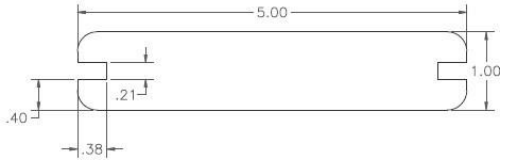
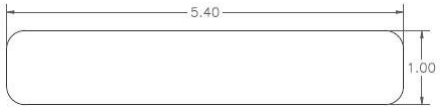
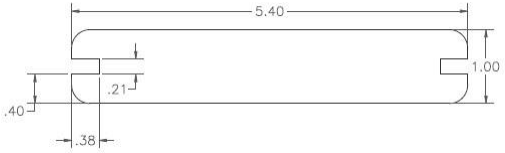
DOCUMENTATION SUBMITTED:

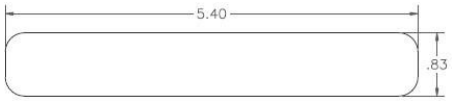
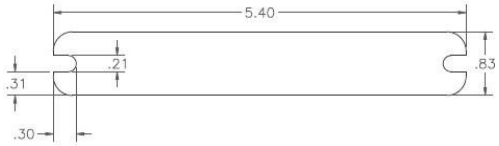
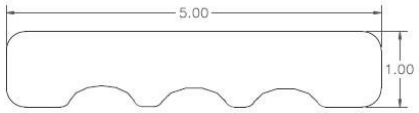
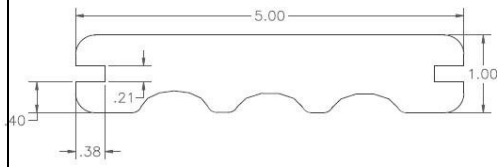
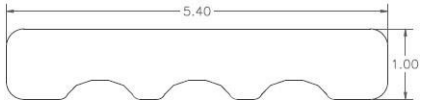
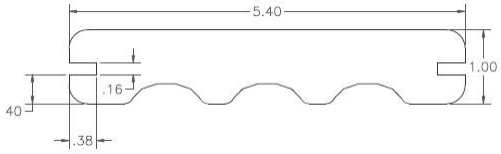
Submitted data was provided in accordance with PFS TECO Certification and Inspection Policy: Deck Boards and Guardrails (Quality control manual, Specifications, Manufacturer's installation instructions, Test data and Descriptive information). The products have been evaluated in accordance with ICC-ES AC174, *Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails).*

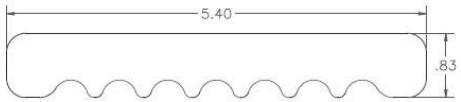
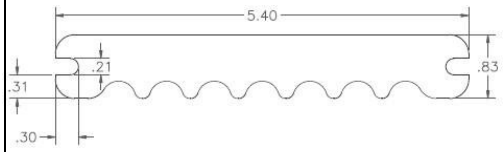
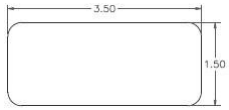
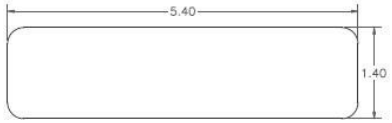
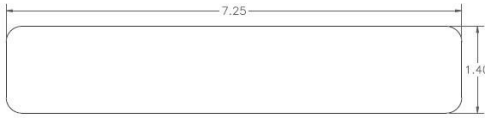
PRODUCT IDENTIFICATION:

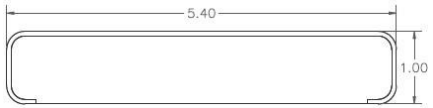
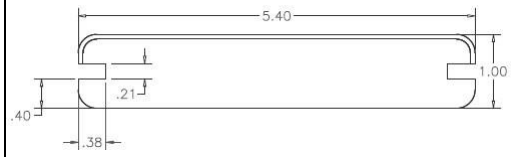
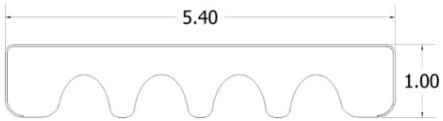
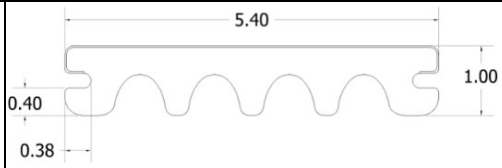
MoistureShield, Inc., deck boards evaluated in this Report must be identified with a label, stamp, or laser imprint on every deck board, or their packaging. The information that is required is as follows: MoistureShield, Inc., product identification, compliance to ASTM D7032 including the maximum deck board span (inches on center spacing of supports) and loading (psf), the PFS TECO Building Product Evaluation Report number (BPER 0110), and PFS Certification Mark for use in the United States (see image below). Deck boards without this information are not covered under this Report.

Table 1: Span Table and Fastening Schedule for Deck Boards

A.1 Deck Boards: Mono-extrusion Production Method - *Vision, Vantage, Vue, ModernView,* ***and*** *LifeCycle*								
Nominal Size and Trade Name	***Shape***	***Edge Type***	***Deck Board Profile***	***Maximum Span Rating (in) for Allowable Load (psf)***			***Fastening Schedule[1] and Uplift Values***	***Maximum Stair Tread Span (in)***
				100	***150***	***200***		
1x5 Generic	*Solid Profile with Radius Corners*	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*9*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*9*
1x5.4 Vision, Vantage	Solid Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*9*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*9*

7/8x5.5 Lifecyle, Modern View	Solid Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*8*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*8*
1x5 Private Label	Oval Fluted Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS *Deck Screw*	*9*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*9*
1x5.4 Private Label	Oval Fluted Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS *Deck Screw*	*9*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*9*

7/8x5.4 Lifecycle	Oval Fluted Profile with Radius Corners	Solid		14	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*8*
		Grooved		14	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*8*
2x4 Vantage	Solid Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*14*
2x6 Vantage, Vision	Solid Profile with Radius Corners	Solid		24	18	16	114 lbf per #7x2-1/4" SS Deck Screw	*16*
2x8 Vision	Solid Profile with Radius Corners	Solid		24	18	16	114 lbf per #7x2-1/4" SS Deck Screw	*16*

A.2 Deck Boards: Co-extrusion Production Method - *Elevate* ***and*** *Meridian*								
Nominal Size	***Shape***	***Edge Type***	***Deck Board Profile***	***Maximum Span Rating (in) for Allowable Load (psf)***			***Fastening Schedule[1] and Uplift Values***	***Maximum Stair Tread Span (in)***
				100	***150***	***200***		
1x5.4 Meridian	Solid Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*10* [2]
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*10* [2]
1x5.4 Elevate	Oval Fluted Profile with Radius Corners	Solid		16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	*8*
		Grooved		16	12	10	100 psf with MoistureShield Deck Clip or Aegis Clip hidden fastening system	*8*

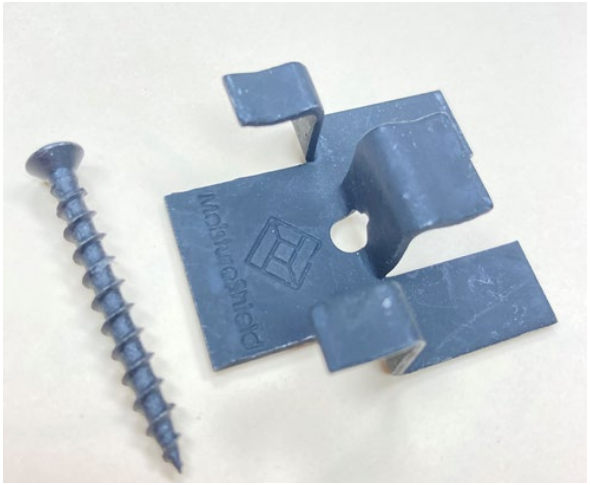
for SI conversion: 1 in = 25.4 mm, 1 psf = 47.9 Pa, 1 lbf = 0.0044 kN

[1] Deck boards installed with screws must be attached to each joist with two #7 x 2-1/4-in. stainless steel deck screws. Deck boards with side grooves installed with hidden fastening system (MoistureShield Deck Clip and Aegis Clip – see image below) must be attached to each joist with a fastener according to the manufacturer's installation instructions.

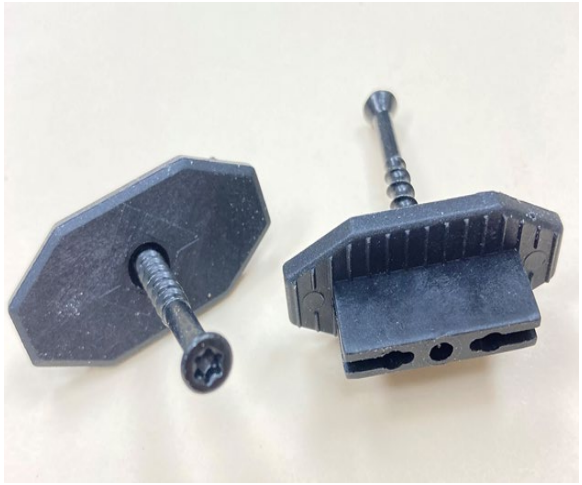
[2] Stair treads installed with two #10 x 2-1/2-in. stainless steel deck screws on each joist.

The joists to which the deck boards are attached must have a minimum specific gravity of 0.50 or better (Southern Pine) or the fastening must be designed. Deck boards and stair treads must be installed over at least two (2) spans. Stair treads must be installed perpendicular to supporting members.

No duration of load increase is allowed for the uplift values noted in Table 1 in this Report.



MoistureShield Deck Clip Hidden Fastening System



Aegis Clip Hidden Fastening System

FlameOFF® FR Clear

Submittal Data Sheet

*** To Be Used @ Treated Supplemental Framing Members not meeting stand alone Class A

Selection & Specification Data

Description

An innovative environmentally friendly clear fire retardant for applications over water absorbent substrates. Water- based, non-corrosive, and non-toxic.

Features

- Free of bromides, halogens, organic compounds and other banned or toxic substances. Non-toxic to humans & the environment; no toxic fumes or smoke released
- When fire is present, treated materials will not ignite or spread flame. Fire is limited to its initial fuel source; afterglow is eliminated
- Non-Corrosive. Prolongs life of seating structures; protects industrial machinery
- Soft hand on textiles & leather, preserves natural look and finish of the material.
- High heat transfer protection (HTP)
- Takes less product to protect more. Solution is less expensive and lighter in weight
- Easy application & clean-up; colorless & odorless

Physical Data

Appearance	10.21021 lb/gal
Density	1.22345
Specific Gravity	Clear to slightly hazy liquid
pH	6.7
Water Solubility	Complete
Odor Description	Odorless
VOC	0%

Testing / Certification

Listing

FlameOFF® FR Clear bears the UL Certification Mark for meeting the UL723/ASTM E-84 Test for Surface Burning Characteristics of Building Materials (see UL Online Certifications Directory at www.ul.com/database for additional information).

*See UL Fire Resistance Directory R40252

Standards Tested To

ASTM E84/UL 723
NFPA 701

Application Rates

Substrate	Strength	Dilution FR Clear: Water	Application Method	Rating Achieved
Wood	100%	None	Spray or Dip	E84/UL 723 Class A
Natural/ Cellular Fibers	50%	1:1	Spray	NFPA 701
Leather	50%	1:1	Spray *Back of hide. Do not spray face/grain.	NFPA 701
Natural/ Synthetic Blend	100%	None	Spray	NFPA 701
Synthetic Fibers	100%	None	Spray	NFPA 701

Coverage Rate

300 sq ft/gallon at full product strength

Curing

During drying process, keep temps below 160°F.
Do not use infrared heat, as this may cause chalking.

How To Apply

FlameOFF® FR Clear may be applied by using a size press, pad, dip, shower spray or spray bottle application. Usage rates of this product may vary between 300-600 SQFT/GALLON depending on pickup and type of material construction. The applicator is responsible to determine the method of application and amount to apply to meet the required standard on the materials needing to be protected. Surface must be dry to the touch prior to application.

FOR TEXTILE APPLICATIONS: A small fabric sample should be processed with FlameOFF® FR Clear in order to test the suitability of the material to accept the product with no damage to the finish/appearance of the textile. Field tests may show that FR Clear maintains effectiveness over some textiles at lower concentrations. In such cases, the customer must perform additional testing to verify the suitability of a reduced concentration for their specific textile. Consult FlameOFF® Coatings Technical Team for guidance.

Packaging, Handling & Storage

Shelf Life

12 Months

Shelf life when kept at recommended storage conditions (45-105° F/7-40°C, indoors, dry) and in original unopened containers.

Packaging

32 oz, 1 Gal, 5 Gal

Phone: (866) 598-8470 Email: info@flameoffcoatings.com Web: www.flameoffcoatings.com

Revised 6/1/2020

SGS

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	J
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47135-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

Client's Identification:

Product Description: Product 2- P350KS Knotted Netting. (3 samples)

Climbing Rope & Netted Rope below overlook

Test Category: Tunnel Test Specifier: BLDG(IBC): ASTM E 84: LE 2021a V 2/22 BG PC: ME BB /dv

TEST PERFORMED: ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

REFERENCE: Comparable to: UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

APPROXIMATE THICKNESS OF SPECIMEN (as measured by SGS North America): 0.763"

SPECIMEN WEIGHT (to include substrate when applicable):

Prior to Conditioning:	59.0 lbs.
Stabilized Weight (taken twice within 24 hours):	59.0 lbs.

PRODUCT CATEGORY:

☒ Textile Type Product
☐ Vinyl Type Product
☐ Other than Textile Type or Vinyl Type Product:

BRIEF DESCRIPTION OF TEST: This test method is used to determine the relative burning behavior of a material under defined test conditions. The test is performed in a 25 ft. long tunnel/duct-like apparatus and is often referred to as the "tunnel test". The test contemplates a calibration where Red Oak burns to the 24 ft. mark in 5.5 minutes ± 15 seconds. During the actual test, a 24 ft. long x 23" wide specimen rests horizontally in a ceiling configuration inside the test chamber facing downward and toward two upward oriented burners. A furnace lid that rests in a water trough seals the chamber tight. A cement board placed on the backside of each specimen assembly protects the furnace lid during the test. The near face of the specimen is subjected to a 4.5 ft. flame insult of approximately 88 kW for ten minutes. The time and distance of the spread of flame along the length of the specimen and the smoke developed as read by the photometric system are all recorded. The Flame Spread and Smoke Developed are reported as an Index.

96 Allen Boulevard Suite D, Farmingdale, NY 11735 USA • Phone: (631) 293-8944 • Email: govmark.test.reports@sgs.com

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	J
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47135-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

SPECIMEN MOUNTING:

☐ Self-supporting: The test specimen was rigid enough to be self-supporting when placed into test position. No additional support was required.

☐ Adhered to IRC: The test specimen was bonded to ¼" Inorganic Reinforced Cement (IRC) boards.

☐ Adhered to Gypsum: The test specimen was adhered to 5/8" thick Type X gypsum board.

☐ Unadhered: The specimen was not adhered to any substrate. Instead, it was laid over a 2" hexagonal wire mesh screen and 1/4" rods.

☒ Other: The netting materials are used in hammock configurations and as a walk on suspended surface. The specimen was laid over a 2" hexagonal wire mesh screen and ¼" rods.

SPECIMEN LENGTH: The 24 ft. length was comprised of:

☐ Continuous unbroken 24 ft. length
☒ Sections: ☒ Three 8 ft. sections butted end to end
☐ Three 8 ft. sections positively joined
☐ Other: _____

ADHESIVE (applied by SGS North America): ☒ No
☐ Yes - (specify):

OBSERVATIONS:

☐ No unusual observations
☒ Burning Drips to Floor further qualified as: ☐ Minor; ☐ Moderate; ☒ Major
☐ Delamination
☐ Sagging
☐ Shrinkage
☐ Fallout (specimen displacement from ceiling mount)
☒ Other: Material fell to the oven floor which resulted in heavy fire pooling down the full 24 foot tunnel.

SGS

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	J
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47135-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

REMARKS:

☒ None
☐ Other: _____

RESULTS:

Flame Spread Index: 80
Smoke Developed: 950

ROUNDING (Per ASTM E84 Reporting Requirements):

Flame Spread Index value has been rounded to the nearest multiple of 5.
Smoke Developed value has been rounded to:

Raw Data	Rounded
Less than 200	Nearest multiple of 5
200 or more	Nearest multiple of 50

CONCLUSION: Based on the reported Results and cited Code Classification System, the item tested is assigned a:

☐ Class I or A rating
☐ Class II or B rating
☐ Class III or C rating
☒ Fails to achieve a minimum classification thereby rendering the product unsuitable in terms of code requirement
☐ Based on product performance*, ASTM E84 is not a suitable test method for the material.

* Severe melt, drip, delamination or other behavior that destroys the continuity of the flame front such that a valid flame spread is unobtainable (See "Remarks")

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Tested For: **William Greeley**
InCord
226 Upton Road
Colchester, CT 06415
USA

Phone: (860) 531-1048
Fax:
Mobile:
PO#: 0024165
Email: billg@incord.com

Received: 3/4/2022
Completed: 3/15/2022
Code: J
Test Report: 3-47135-0

Key Test: ASTM E84 (Int Fin) 850

DATA SUMMARY:

Time to Ignition (minutes:seconds): 00:26
Maximum Flame Spread "Distance" (feet): 19.5
Maximum Flame Spread "Time" (seconds): 345

CODE CLASSIFICATION SYSTEM (Please see "ASTM E84 Limitations"):

Flame Spread Index		Smoke Developed
Class I or A:	0 - 25	450 or less
Class II or B:	26 - 75	450 or less
Class III or C:	76 - 200	450 or less

BUILDING CODE CITATION FOR THE CLASSIFICATION SCHEME:

(1) 2015 edition, NFPA 101 Life Safety Code, para. 10.2.3.4
(2) 2015 edition, NFPA 5000 Building Construction & Safety Code, para. 10.4.2
(3) 2018 edition, International Building Code, para. 803.1.2

LIMITATIONS OF THE ASTM E84 CLASSIFICATION SCHEME: Most building codes will accept the ASTM E84 classifications when the interior finish product is used in a sprinklered area. Certain local authorities such as NYC have more stringent requirements, i.e. Smoke Developed ranges from a maximum 25 to 100.

If the interior finish product is a textile or vinyl wall covering used in a non-sprinklered area, the NFPA 265 room corner fire test applies.

Certain products which give off excessive heat such as but not limited to cellular plastics, cellular foam (either with or without coverings as applicable), polypropylene, and high density polyethylene should be tested by NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth. In SGS North America's opinion, the codes require NFPA 286 for such products, even in sprinklered areas.

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	J
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47135-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

CERTIFICATION: I certify that the reported results were obtained after testing specimens in accordance with the procedures and equipment specified above.

DocuSigned by:
Theresa MacMillan
28F70AF28D7845C...

3/17/2022

Test Engineer: Theresa MacMillan

AUTHORIZED SIGNATURE
SGS NORTH AMERICA
/dv /tc

Enclosure: Graphs

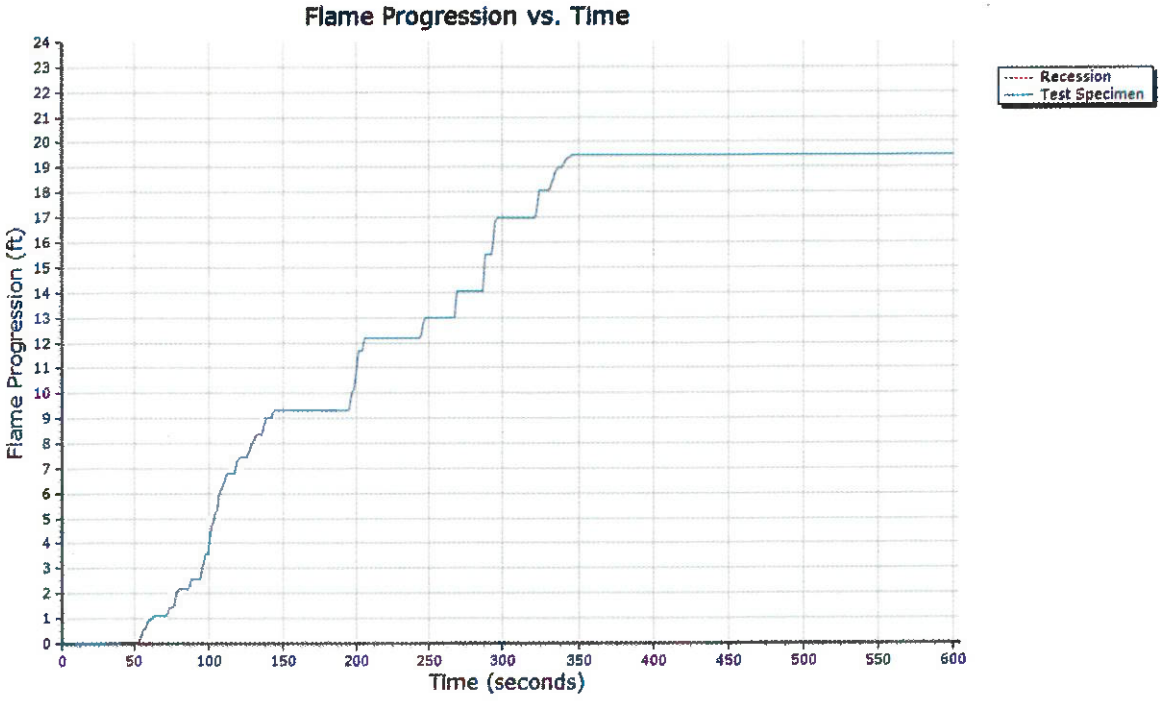
96 Allen Boulevard Suite D, Farmingdale, NY 11735 USA • Phone: (631) 293-8944 • Email: govmark.test.reports@sgs.com

SGS GOVMARK

Program: ASTM E84 (Version 2.10)

Test Method	: ASTM E84
Test Report #	: 3-47135-0-J
Date	: 3/15/2022
Client	: InCord
Operator	: Theresa MacMillan
Details of Preparation	: The test specimens were comprised of three 8 ft. sections butted end to end and laid over 2" hexagonal wire mesh screen and 1/4" rods.
Observations	: Heavy burning drips/fire pooling throughout the full 24 foot tunnel.

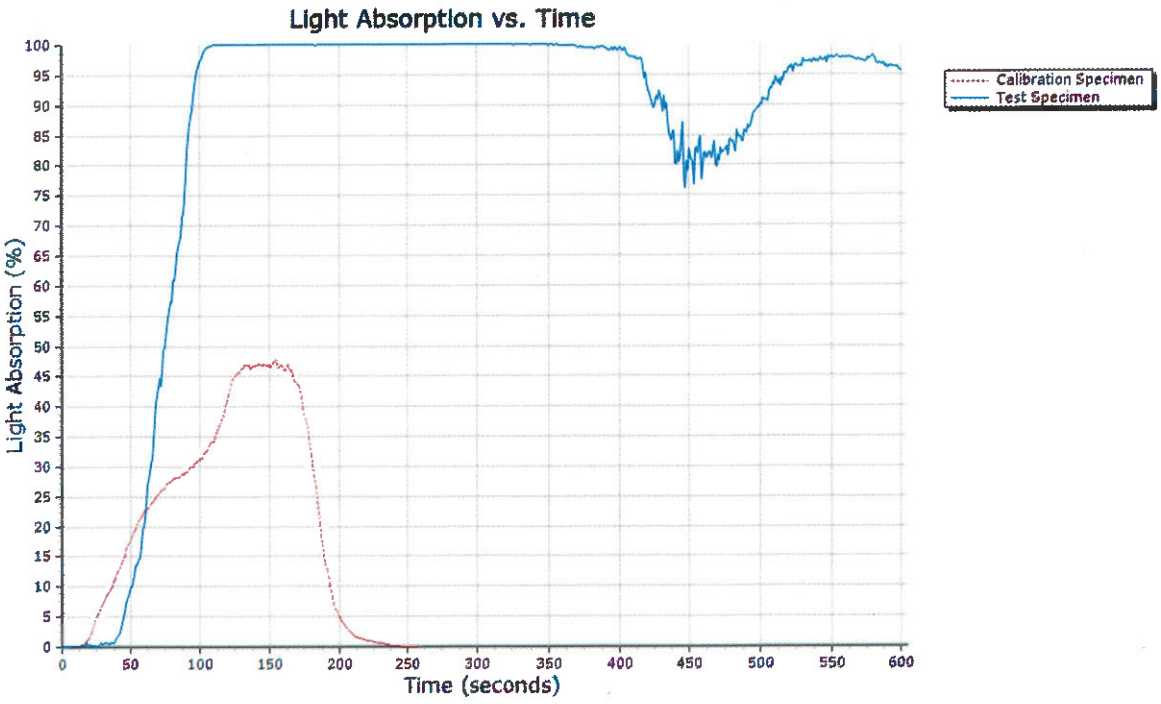
Area Under Flame Curve (ft min)	: 133.52
Raw Flame Spread Index (ft min)	: 79.70
Rounded Flame Spread Index (ft min)	: **80**
Ignition Time	: **00:26**
Area Under Smoke Curve (%A min)	: 848.43
Raw Smoke-Developed Index	: 943.45
Rounded Smoke-Developed Index	: **950**
Total Gas Flow(L)	: 1598.7
Total Gas Flow(ft^3)	: 56.5
Maximum Flame Front Achieved(ft)	: 19.5 (@345s)



SGS GOVMARK

Program: ASTM E84 (Version 2.10)

Test Method : ASTM E84
Test Report # : 3-47135-0-J



SGS

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	I
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47134-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

Client's Identification:

Product Description: Product 1 - CCRN 5/8" Cargo Net. (3 samples)

Safety Netting making up handrails

Test Category: Tunnel Test Specifier: BLDG(IBC): ASTM E 84: LE 2021a V 2/22 BG PC: ME BB /dv

TEST PERFORMED: ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

REFERENCE: Comparable to: UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

APPROXIMATE THICKNESS OF SPECIMEN (as measured by SGS North America): 0.625"

SPECIMEN WEIGHT (to include substrate when applicable):

Prior to Conditioning:	20.7 lbs.
Stabilized Weight (taken twice within 24 hours):	20.7 lbs.

PRODUCT CATEGORY:

☒ Textile Type Product
☐ Vinyl Type Product
☐ Other than Textile Type or Vinyl Type Product:

BRIEF DESCRIPTION OF TEST: This test method is used to determine the relative burning behavior of a material under defined test conditions. The test is performed in a 25 ft. long tunnel/duct-like apparatus and is often referred to as the "tunnel test". The test contemplates a calibration where Red Oak burns to the 24 ft. mark in 5.5 minutes ± 15 seconds. During the actual test, a 24 ft. long x 23" wide specimen rests horizontally in a ceiling configuration inside the test chamber facing downward and toward two upward oriented burners. A furnace lid that rests in a water trough seals the chamber tight. A cement board placed on the backside of each specimen assembly protects the furnace lid during the test. The near face of the specimen is subjected to a 4.5 ft. flame insult of approximately 88 kW for ten minutes. The time and distance of the spread of flame along the length of the specimen and the smoke developed as read by the photometric system are all recorded. The Flame Spread and Smoke Developed are reported as an Index.

96 Allen Boulevard Suite D, Farmingdale, NY 11735 USA • Phone: (631) 293-8944 • Email: govmark.test.reports@sgs.com

Tested For: **William Greeley**
InCord
226 Upton Road
Colchester, CT 06415
USA

Phone: (860) 531-1048
Fax:
Mobile:
PO#: 0024165
Email: billg@incord.com

Received: 3/4/2022
Completed: 3/15/2022
Code: I
Test Report: 3-47134-0

Key Test: ASTM E84 (Int Fin) 850

SPECIMEN MOUNTING:

☐ Self-supporting: The test specimen was rigid enough to be self-supporting when placed into test position. No additional support was required.

☐ Adhered to IRC: The test specimen was bonded to ¼" Inorganic Reinforced Cement (IRC) boards.

☐ Adhered to Gypsum: The test specimen was adhered to 5/8" thick Type X gypsum board.

☐ Unadhered: The specimen was not adhered to any substrate. Instead, it was laid over a 2" hexagonal wire mesh screen and 1/4" rods.

☒ Other: The netting materials are used in hammock configurations and as a walk on suspended surface. The specimen was laid over a 2" hexagonal wire mesh screen and ¼" rods.

SPECIMEN LENGTH: The 24 ft. length was comprised of:

☐ Continuous unbroken 24 ft. length
☒ Sections: ☒ Three 8 ft. sections butted end to end
☐ Three 8 ft. sections positively joined
☐ Other: _____

ADHESIVE (applied by SGS North America): ☒ No
☐ Yes - (specify):

OBSERVATIONS:

☐ No unusual observations
☒ Burning Drips to Floor further qualified as: ☐ Minor; ☐ Moderate; ☒ Major
☐ Delamination
☐ Sagging
☐ Shrinkage
☐ Fallout (specimen displacement from ceiling mount)
☒ Other: Material fell to the oven floor which resulted in heavy fire pooling down the full 24 foot tunnel.

SGS

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	I
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47134-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

REMARKS:

☒ None
☐ Other: _____

RESULTS:

Flame Spread Index: 110
Smoke Developed: 400

ROUNDING (Per ASTM E84 Reporting Requirements):

Flame Spread Index value has been rounded to the nearest multiple of 5.
Smoke Developed value has been rounded to:

Raw Data	Rounded
Less than 200	Nearest multiple of 5
200 or more	Nearest multiple of 50

CONCLUSION: Based on the reported Results and cited Code Classification System, the item tested is assigned a:

☐ Class I or A rating
☐ Class II or B rating
☒ Class III or C rating
☐ Fails to achieve a minimum classification thereby rendering the product unsuitable in terms of code requirement
☐ Based on product performance*, ASTM E84 is not a suitable test method for the material.

* Severe melt, drip, delamination or other behavior that destroys the continuity of the flame front such that a valid flame spread is unobtainable (See "Remarks")

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Tested For: **William Greeley**
InCord
226 Upton Road
Colchester, CT 06415
USA

Phone: (860) 531-1048
Fax:
Mobile:
PO#: 0024165
Email: billg@incord.com

Received: 3/4/2022
Completed: 3/15/2022
Code: I
Test Report: 3-47134-0

Key Test: ASTM E84 (Int Fin) 850

DATA SUMMARY:

Time to Ignition (minutes:seconds): 00:26
Maximum Flame Spread "Distance" (feet): 19.5
Maximum Flame Spread "Time" (seconds): 255

CODE CLASSIFICATION SYSTEM (Please see "ASTM E84 Limitations"):

Flame Spread Index		Smoke Developed
Class I or A:	0 - 25	450 or less
Class II or B:	26 - 75	450 or less
Class III or C:	76 - 200	450 or less

BUILDING CODE CITATION FOR THE CLASSIFICATION SCHEME:

(1) 2015 edition, NFPA 101 Life Safety Code, para. 10.2.3.4
(2) 2015 edition, NFPA 5000 Building Construction & Safety Code, para. 10.4.2
(3) 2018 edition, International Building Code, para. 803.1.2

LIMITATIONS OF THE ASTM E84 CLASSIFICATION SCHEME: Most building codes will accept the ASTM E84 classifications when the interior finish product is used in a sprinklered area. Certain local authorities such as NYC have more stringent requirements, i.e. Smoke Developed ranges from a maximum 25 to 100.

If the interior finish product is a textile or vinyl wall covering used in a non-sprinklered area, the NFPA 265 room corner fire test applies.

Certain products which give off excessive heat such as but not limited to cellular plastics, cellular foam (either with or without coverings as applicable), polypropylene, and high density polyethylene should be tested by NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth. In SGS North America's opinion, the codes require NFPA 286 for such products, even in sprinklered areas.

Tested For:	**William Greeley**	**Phone:**	(860) 531-1048	**Received:**	3/4/2022
	InCord	**Fax:**		**Completed:**	3/15/2022
	226 Upton Road	**Mobile:**		**Code:**	I
	Colchester, CT 06415	**PO#:**	0024165	**Test Report:**	3-47134-0
	USA	**Email:**	billg@incord.com		

Key Test: ASTM E84 (Int Fin) 850

CERTIFICATION: I certify that the reported results were obtained after testing specimens in accordance with the procedures and equipment specified above.

DocuSigned by:
Theresa MacMillan
28F70AF28D7845C...

3/17/2022

Test Engineer: Theresa MacMillan

AUTHORIZED SIGNATURE
SGS NORTH AMERICA
/dv /tc

Enclosure: Graphs

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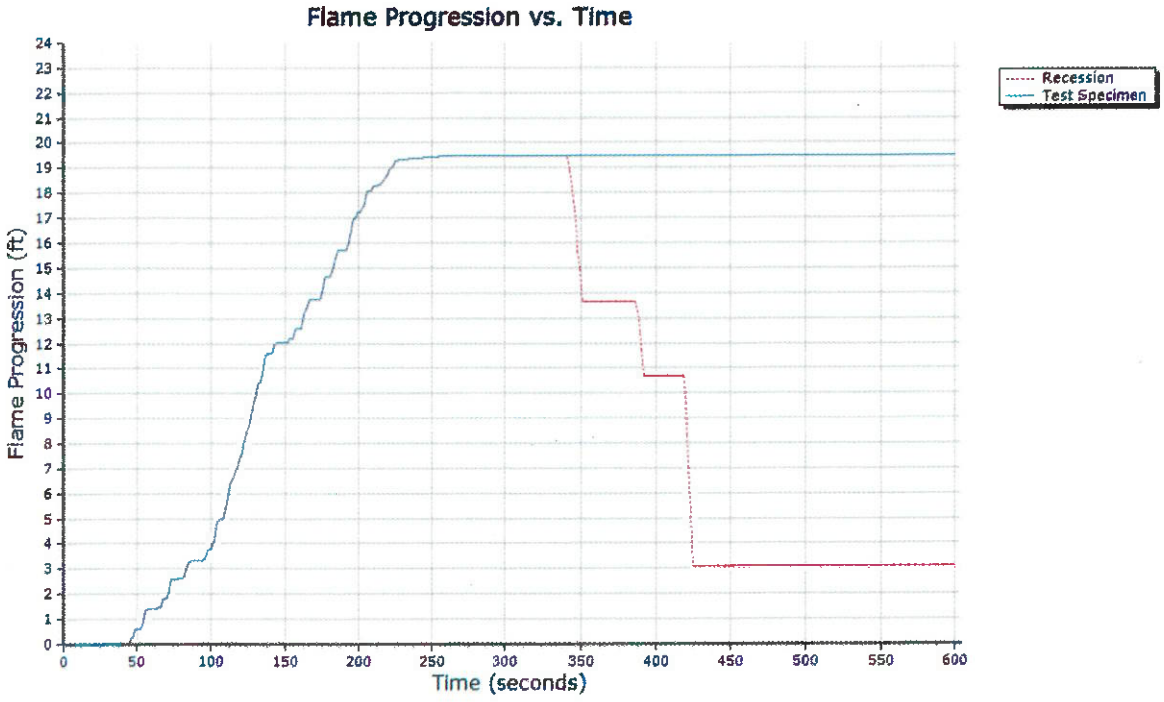
SGS GOVMARK

Program: ASTM E84 (Version 2.10)

Test Method	: ASTM E84
Test Report #	: 3-47134-0-I
Date	: 3/15/2022
Client	: InCord
Operator	: Theresa MacMillan
Details of Preparation	: The test specimens were comprised of three 8 ft. sections butted end to end and laid over 2" hexagonal wire mesh screen and 1/4" rods.
Observations	: Heavy burning drips/fire pooling throughout the full 24 foot tunnel.

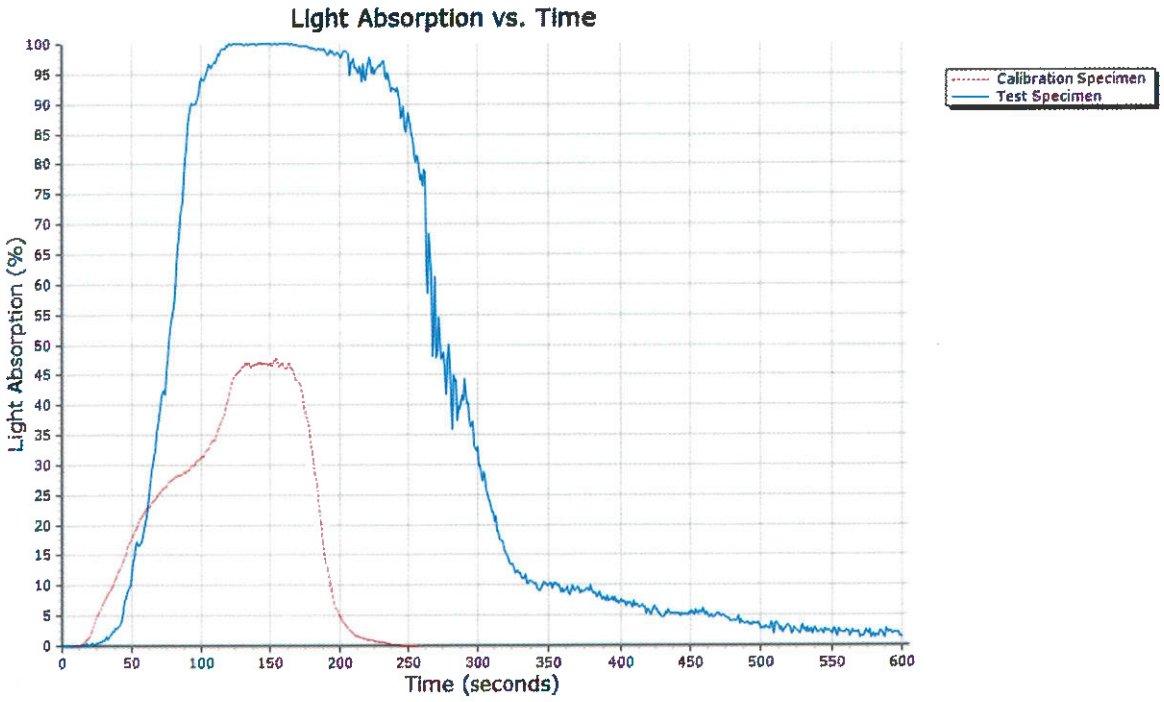
Area Under Flame Curve (ft min)	: 150.27
Raw Flame Spread Index (ft min)	: 109.54
Rounded Flame Spread Index (ft min)	: **110**
Ignition Time	: **00:26**
Area Under Smoke Curve (%A min)	: 366.32
Raw Smoke-Developed Index	: 407.35
Rounded Smoke-Developed Index	: **400**
Total Gas Flow(L)	: 1597.4
Total Gas Flow(ft^3)	: 56.4
Maximum Flame Front Achieved(ft)	: 19.5 (@255s)



SGS GOVMARK

Program: ASTM E84 (Version 2.10)

Test Method : ASTM E84
Test Report # : 3-47134-0-I



3-Part Specification: **PlayBound™ Poured-in-Place**

SURFACEAMERICA®

Surface America, Inc. • PO Box 157 • Williamsville, NY 14231
Phone: (800) 999-0555 • Phone: (716) 632-8413 • Fax: (716) 632-8324
info@surfaceamerica.com • www.surfaceamerica.com

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Poured-in-Place Playground Surfacing System: Super-7 (when aromatic urethane for the top surface is specified) with a 7-year warranty & Extreme-10 (when aliphatic urethane for the top surface is specified) with a 10-year warranty.

Specifier Note: Revise paragraph below to suit project requirements. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the paragraph below. In the absence of related sections, delete paragraph below.

Specifier Note: Site materials and methods, drainage, playground equipment, fencing, substrate preparation and similar work is provided by others and is described in other sections. Consult manufacturer for specific substrate preparation requirements. Edit, retain or delete paragraph below to suit project requirements and specifier practice.

B. Related Sections: Division 2 Sitework Sections: Materials and Methods, Excavation, Asphalt Paving, Concrete Paving, Sub-Drainage, Storm Drainage, Fencing, Playground Equipment and Structures.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 1 References Section may establish the edition date of standards. This article does not require compliance with standard. It is a listing of all references used in this section.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

2. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

3. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.

4. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.

5. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.

6. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.

7. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

Specifier Note: Article below should be restricted to statements describing design or performance requirements and functional (not dimensional) tolerances of a complete system. Limit descriptions to composite and operational properties required to link components of a system together and to interface with other systems.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide a 2-layer rubber-urethane playground surfacing system which has been designed, manufactured and installed to meet the following criteria:

1. Shock Attenuation (ASTM F1292):

a. Gmax: Less than 200.

b. Head Injury Criteria: Less than 1000.

2. Flammability (ASTM D2859): Pass.

3. Tensile Strength (ASTM D412): 60 psi (413 kPa).

4. Tear Resistance (ASTM D624): 140%.

5. Water Permeability: 0.4 gal/yd2/second.

6. Accessibility: Comply with requirements of ASTM F1951.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect’s and Contractor’s duties and responsibilities in Conditions of the Contract and Division 1 Submittal Procedures Section.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer’s product data and installation instructions.

C. Verification Samples: Submit manufacturer’s standard verification samples of 9" x 9" (229 x 229 mm) minimum.

D. Quality Assurance/Control Submittals: Submit the following:

1. Certificate of qualifications of the playground surfacing installer.

E. Closeout Submittals: Submit the following:

1. Warranty documents specified herein.

Specifier Note: Article below should include statements of prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 1 Quality Assurance Section.

1.05 QUALITY ASSURANCE

A. Qualifications: Utilize an installer approved and trained by the manufacturer of the playground surfacing system, having experience with other projects of the scope and scale of the work described in this section.

B. Certifications: Certification by manufacturer that installer is an approved applicator of the playground surfacing system.

C. International Play Equipment Manufacturers Association (IPEMA) certified.

Specifier Note: Article below should include specific protection and environmental conditions required during storage. Coordinate article below with Division 1 Product Requirements Section.

1.06 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirement Section.

B. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

Specifier Note: In article below, state physical or environmental limitations or criteria for installation such as weather, temperature, humidity, ventilation or illumination required for proper installation or application.

1.07 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Install surfacing system when minimum ambient temperature is 40 degrees F (1 degree C) and maximum ambient temperature is 90 degrees F (32 degrees C). Do not install in steady or heavy rain.

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 1 Closeout Submittals (Warranty) Section. Use this article to require special or extended warranty or bond covering the work of this section.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

C. Proper drainage is critical to the longevity of the PlayBound Poured-in-Place surfacing system. Inadequate drainage will cause premature breakdown of the poured system in affected areas; and void the warranty.

Specifier Note: Coordinate subparagraph below with manufacturer's warranty requirements.

1. Warranty Period: Super-7 (when aromatic urethane for the top surface is specified): 7 years from date of completion of work. Extreme-10 (when aliphatic urethane for the top surface is specified): 10 years from date of completion of work.

PART 2 – PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 POURED-IN-PLACE PLAYGROUND SURFACING SYSTEM

Specifier Note: Retain or delete paragraph below per project requirements and specifier's practice.

A. Manufacturer: Surface America, Inc.

1. Contact: PO Box 157, Williamsville, NY 14231; Telephone: (800) 999-0555, (716) 632-8413; Fax: (716) 632-8324; E-mail: info@surfaceamerica.com; website: http://www.surfaceamerica.com.

B. Proprietary Products/Systems. Poured-in-place playground surfacing system, including the following:

1. PlayBound Poured-In-Place Primer:

a. Material: Urethane.

2. PlayBound Poured-in-Place Basemat:

a. Material: Blend of 100% recycled SBR (styrene butadiene rubber) and urethane.

Specifier Note: The type of playground equipment determines the required basemat thickness, and the basemat thickness may be different at various locations on the playground site. Depending on ASTM

F1292 requirements for critical fall height (4’, 5’, 6’, 7’, 8’, 9’, 10’, 12’ or 13’ (1219, 1524, 1829, 2134, 2438, 2743, 3048, 3657 or 3962 mm), select basemat thickness from options provided in subparagraph below (1 1/4 ", 2”, 2 1/2", 2 1/2", 3”, 3 1/2", 4", 4 1/2”, 5" or 6" (32, 51, 63, 63, 76, 89, 102, 114, 127 or 152 mm, respectively). Specify project requirements below and coordinate with working drawings.

b. Thickness: [1 1/4" (31.75 mm) for 4’ critical fall height] [2" (51 mm) for 5’ critical fall height] [2 1/2” (64 mm) for 6’ and 7’ critical fall heights] [3" (76 mm) for 8’ critical fall height] [3 1/2" (89 mm) for 9’ critical fall height] [4" (102 mm) for 10’ critical fall height] [5" (127 mm) for 12’ critical fall height] [6" (152 mm) for 13’ critical fall height].

c. Formulation Components: Blend of strand and granular material.

3. PlayBound Poured-In-Place Top Surface:

a. Material: Blend of Virgin EPDM (ethylene propylene diene monomer) rubber or TPV Granule and aromatic or aliphatic urethane binder.

b. Thickness: Nominal 1/2" (12.7 mm), minimum 3/8" (9.5 mm), maximum 5/8" (15.9 mm).

c. Color: [Standard] [Terra Cotta Red] [Primary Red] [Orange] [Gold] [Beige] [Yellow] [Bright Green] [Hunter Green] [Teal] [Sky Blue] [Royal Blue] [Purple] [Pearl] [Eggshell] [Brown] [Light Gray] [Dark Gray] [Black] [Custom color – specify requirements].

Specifier Note: Aliphatic urethane (Extreme-10) is recommended for certain colors (blue, teal, purple, pearl, eggshell and grays) because aromatic binder (Super-7) “yellows” slightly upon exposure to ultraviolet rays. Most of this thin layer of urethane wears off with foot traffic and weathering typically within two to six months. *This characteristic applies industry-wide.*

d. Dry Static Coefficient of Friction (ASTM D2047): 1.0.

e. Wet Static Coefficient of Friction (ASTM D2047): 0.9.

f. Dry Skid Resistance (ASTM E303): 89.

g. Wet Skid Resistance (ASTM E303): 57.

Specifier Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

Specifier Note: Specify proportions and procedures for site mixing materials. Mixing is the preparation of materials for use and is considered to be part of the manufacturing process.

2.03 MIXES

A. Required mix proportions by weight:

1. Basemat: 16+% urethane (as ratio: 14% urethane divided by 86% rubber). 14% urethane, 86% rubber (based on entire rubber & urethane mix).

2. Top Surface: 22% urethane (ratio: 18% urethane divided by 82% rubber). 18% urethane, 82% rubber (based on entire rubber & urethane mix).

PART 3 – EXECUTION

Specifier Note: Revise article below to suit project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

A. Comply with the instructions and recommendations of the playground surfacing manufacturer.

Specifier Note: Specify actions to physically determine that conditions are acceptable to receive primary products of the section.

3.02 EXAMINATION

A. Substrate preparation must be in accordance with surfacing manufacturer's specification. New asphalt must be fully cured – up to 30 days. New concrete must be fully cured – up to 7 days.

B. Proper drainage is critical to the longevity of the PlayBound Poured-in-Place surfacing system. Inadequate drainage will cause premature breakdown of the poured system in affected areas; and void the warranty.

Specifier Note: Specify actions required to physically prepare the surface, area, or site or to incorporate the primary products of the section.

3.03 PREPARATION

A. Surface Preparation: Using a brush or short nap roller, apply primer to the substrate perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft2/gal (7.5 m2/L).

Specifier Note: Coordinate article below with manufacturer's recommended installation requirements.

3.04 INSTALLATION

A. Do not proceed with playground surfacing installation until all applicable site work, including substrate preparation, fencing, playground equipment installation and other relevant work, has been completed.

B. Basemat Installation:

1. Using screeds and hand trowels, install the basemat at a consistent density of 29 pounds, 1 ounce per cubic foot (466 kg/m3) to the specified thickness.

2. Allow basemat to cure for sufficient time so that indentations are not left in the basemat from applicator foot traffic or equipment.

3. Do not allow foot traffic or use of the basemat surface until it is sufficiently cured.

C. Primer Application: Using a brush or short nap roller, apply primer to the basemat perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft2/gal (7.5 m2/L).

D. Top Surface Installation:

1. Using a hand trowel, install top surface at a consistent density of 58 pounds, 9 ounces per cubic foot (938 kg/m3) to a nominal thickness of 1/2" (12.7 mm).

2. Allow top surface to cure for a minimum of 48 hours.

3. At the end of the minimum curing period, verify that the top surface is sufficiently dry and firm to allow foot traffic and use without damage to the surface.

4. Do not allow foot traffic or use of the surface until it is sufficiently cured.

Specifier Note: Specify provisions for protecting work after installation but prior to acceptance by the owner. Coordinate article below with Division 1 Execution Requirements Section.

3.05 PROTECTION

A. Protect the installed playground surface from damage resulting from subsequent construction activity on the site.

NOVA Chemicals

NOVAPOL® Product Data Sheet | Polyethylene

Plastic Slides

TR-0735-U(UG)

Hexene Copolymer LLDPE Rotational Molding Resin

www.novachemicals.com

U.S. Commercial Center
NOVA Chemicals Inc.
1555 Coraopolis Heights Road
Moon Township, PA 15108
United States of America

Phone	412.490.4170
Toll-Free	800.222.7213
Fax	412.490.4083

Technical Centre
NOVA Chemicals Technical Centre
3620 - 32 Street N.E.
Calgary, Alberta
Canada T1Y 6G7

Phone	403.291.8444
Fax	403.291.0493

Head Office
NOVA Chemicals Corpcration
1000 Seventh Avenue S.W.
P.O. Box 2518, Station M
Calgary, Alberta
Canada T2P 5C6

Phone	403.750.3600
Fax	403.269.7410

AVAILABILITY

NOVAPOL polyethylene resins are available in bulk hopper cars, hopper trucks, boxes, sea bulk containers, or bags. The product type and batch number are clearly marked on each container. Contact the NOVA Chemicals sales office nearest you for availability in your area.

STORAGE/HANDLING

TR-0735-U(UG) should be stored in a clean, dry place at ambient temperatures. Prolonged or improper storage can result in deterioration of product properties. Care should be taken when handling and transferring product to prevent foreign matter contamination. The NOVA Chemicals Material Safety Data Sheet (MSDS) contains important safety information and should be reviewed before using the product.

PROCESSING CONDITIONS

Comprehensive assistance with processing conditions and technology is available from NOVA Chemicals Technical Service at (403) 291-8444.

FOOD PACKAGING STATUS

United States: TR-0735-U(UG) complies with the specifications contained in the U.S. Food and Drug Administration (FDA) regulation 21 CFR 177.1520 for olefin polymers, para. (c) 3.2a, and may thus be used in the United States as an article or component of an article intended for use in contact with food. TR-0735-U(UG) is subject to the specific limitations that it may contact food only in articles having a volume of at least 18.9 L (5 gal. U.S.) only at temperatures below 212°F, and may not be used to hold ready-prepared foods intended to be reheated in the container at time of use (21 CFR 176.170(c) Table 2, conditions of use C–G).

Other Countries: For regulatory compliance information for other countries, please contact your nearest NOVA Chemicals office.

TR-0735-U(UG) is Certified by NSF to NSF/ANSI Standards #24 and #61. In addition:
- the production facility is audited annually to assure that only authorized materials are used in the product;
- quality assurance and quality control procedures are followed in fabrication, and all the requirements of the standard continue to be met;
- products are sampled and retested on schedule; and
- labeling and product literature are true and accurate with respect to the NSF listed products.

ENVIRONMENTAL

NOVA Chemicals polyethylene resins are biologically and chemically inert, but improper disposal may present an ingestion hazard to wildlife. Where recycling of NOVA Chemicals' polyethylene resins is not possible, disposal to landfill or incineration in accordance with all applicable government laws and regulations is recommended. Please contact NOVA Chemicals Technical Service for further information on recycling and disposal of NOVA Chemicals resins.

is the SPI resin code developed for low density and linear low density polyethylene to identify material type for sorting and recycling purposes.

January 16, 2012

TR-0735-U(UG)

Hexene Copolymer LLDPE Rotational Molding Resin

PROPERTIES		ASTM[1]	UNITS	TYPICAL VALUES[2]
Melt Index[3]		D 1238	g/10 min	7.0
Density		D 792	g/cm³	0.935
ESCR, (F_{50})[4]		D 1693	h	> 1 000
Flexural Modulus	(5)	D 790	MPa (psi)	680 (98 600)
Tensile Yield Strength	(6)	D 638	MPa (psi)	17.1 (2 500)
Elongation at Yield	(6)	D 638	%	12
Melting Point (DSC)			°C (°F)	125 (257)
Heat Distortion Temperature				
- 66 psi (4.64 kg/cm²)		D 648	°C (°F)	58 (136)
- 264 psi (18.56 kg/cm²)		D 648	°C (°F)	42 (108)
ARM Low Temperature Impact	(7)			
- 0.125" (3.17 mm)		ARM Method	J (ft-lb)	68 (50)
- 0.250" (6.35 mm)		ARM Method	J (ft-lb)	203 (150)

(1) Properties designated have been determined using methods which are in accordance with, or substantially in accordance with, the specified testing standards.

(2) Typical Values represent average laboratory values and are intended as guides only, not as specifications.

(3) Condition 190°C/2.16 kg.

(4) Condition A & B, 100% IGEPAL, 50°C, F50 values. From compression molded specimens.

(5) 1% Strain Value. From compression molded samples.

(6) Type IV specimen, 2" (50.8 mm) per minute test speed, 0.075" (1.9 mm) thickness compression molded samples.

(7) -40°C on rotomolded samples

Melt Index 7.0

Density 0.935

FEATURES

- Good impact properties
- Excellent processability
- NSF listed for Standards #24 & #61
- UL 94 HB

ADDITIVES

- Processing antioxidants
- UV stabilizers

APPLICATIONS

- Toys
- Complex custom parts
- Home and garden items
- Mailboxes

From: Rittlinger, David B
To: Jamison M. Roe
Cc: Tracy Phillips
Subject: RE: [EXTERNAL] FW: [External] Kaleideum Site Plan
Date: Wednesday, August 30, 2023 1:01:00 PM
Attachments: image002.png
image003.png
image004.png
image005.png
image007.png
image009.png
image010.png
image011.png
image012.png
image013.png

Jamison,
Good afternoon.
I am in receipt of the request of a formal interpretation.
Our office will provide a response letter as soon as possible.
Let me know if you have any questions.
Thank you.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
https://codes.iccsafe.org/codes/north-carolina

From: Jamison M. Roe <jamisonr@cityofws.org>
Sent: Wednesday, August 30, 2023 10:45 AM
To: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Cc: Tracy Phillips <tracyp@cityofws.org>
Subject: RE: [EXTERNAL] FW: [External] Kaleideum Site Plan

Good morning David,
I've attached my formal interpretation request. There's a written detail attached to the form file. I also attached the full plan set for the structure again in case it was needed. Let me know if there's anything else you need from me. Thanks for all your help.

Jamie Roe
Senior Plans Examiner
Building Inspector
Winston Salem / Forsyth County
PLANNING & DEVELOPMENT SERVICES

Bryce A. Stuart Municipal Building
100 E. First Street, Suite 328
Winston-Salem, NC 27101

Office: 336-747-7464
Mobile: 336-462-7486
Fax: 336-727-2792

From: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Sent: Friday, August 25, 2023 9:56 AM
To: Jamison M. Roe <jamisonr@cityofws.org>
Subject: RE: [EXTERNAL] FW: [External] Kaleideum Site Plan

Jamison,
Here is the link to the formal interpretation request form.
https://www.ncosfm.gov/appeals-and-formal-interpretations

Return the completed form to me should you choose to move forward with this request.

Let me know if you have any questions.
Thank you.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
https://codes.iccsafe.org/codes/north-carolina

From: Rittlinger, David B
Sent: Tuesday, August 8, 2023 8:34 AM
To: Jamison M. Roe <jamisonr@cityofws.org>
Subject: RE: [EXTERNAL] FW: [External] Kaleideum Site Plan

Jamison,
You are welcome.
Have a good day.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
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From: Jamison M. Roe <jamisonr@cityofws.org>
Sent: Monday, August 7, 2023 1:03 PM
To: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Subject: RE: [EXTERNAL] FW: [External] Kaleideum Site Plan

Alright, thanks David. I was unaware of the others conversations.

Take care!

Jamie Roe
Senior Plans Examiner
Building Inspector
Winston Salem / Forsyth County

PLANNING & DEVELOPMENT SERVICES

Bryce A. Stuart Municipal Building
100 E. First Street, Suite 328
Winston-Salem, NC 27101

Office: 336-747-7464
Mobile: 336-462-7486
Fax: 336-727-2792

From: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Sent: Monday, August 7, 2023 11:15 AM
To: Jamison M. Roe <jamisonr@cityofws.org>
Subject: [EXTERNAL] FW: [External] Kaleideum Site Plan

Jamison,
Please read below.
Let me know if you have any questions.
Thank you

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
https://codes.iccsafe.org/codes/north-carolina

From: Taylor, Brian T <brian.taylor@ncdoi.gov>
Sent: Monday, August 7, 2023 9:56 AM
To: Rittlinger, David B <david.rittlinger@ncdoi.gov>; Chaz Browning <charlesb@cityofwsfire.org>
Cc: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>; Mayo, William L <WILLIAMLM@CITYOFWSFIRE.ORG>
Subject: RE: [External] Kaleideum Site Plan

Thank you David and Charlie for taking a closer look at this this to see if their were any other options.

Brian Taylor
Chief State Fire Marshal | Assistant Commissioner

N.C. Department of Insurance
Office of State Fire Marshal
1202 Mail Service Center
Raleigh, NC 27699-1202
919.647.0003

From: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Sent: Monday, August 7, 2023 8:26 AM
To: Chaz Browning <charlesb@cityofwsfire.org>
Cc: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>; Taylor, Brian T <brian.taylor@ncdoi.gov>; Mayo, William L <WILLIAMLM@CITYOFWSFIRE.ORG>
Subject: RE: [External] Kaleideum Site Plan

Chaz,
Good morning.
The 30 foot rule exemption applies only to exterior walls of Type II buildings in the fire district as per 2018 NCBC D102.2.6.

D102.2.6 Exterior walls.

Exterior load-bearing walls of Type II buildings shall have a *fire-resistance rating* of 2 hours or more where such walls are located within 30 feet (9144 mm) of a common property line or an assumed property line. Exterior nonload-bearing walls of Type II buildings located within 30 feet (9144 mm) of a common property line or an assumed property line shall have fire-resistance ratings as required by Table 601, but not less than 1 hour. Exterior walls located more than 30 feet (9144 mm) from a common property line or an assumed property line shall comply with Table 601.

Exception: In the case of one-story buildings that are 2,000 square feet (186 m^2) or less in area, exterior walls located more than 15 feet (4572 mm) from a common property line or an assumed property line need only comply with Table 601.

This 30 foot clearance is not applicable to combustible structures.

Let me know if you have any questions.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

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From: Chaz Browning <charlesb@cityofwsfire.org>
Sent: Friday, August 4, 2023 5:38 PM
To: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Cc: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>; Taylor, Brian T <brian.taylor@ncdoi.gov>; Mayo, William L <WILLIAMLM@CITYOFWSFIRE.ORG>
Subject: Re: [External] Kaleideum Site Plan

David,

Thanks for responding. I appreciate all the info but we were under the impression you'd be exalting the site plan for a different purpose.

When Chief Mayo spoke to Brian Taylor about the Kaleideum project, Brian said that as long as the building had 30 feet of clearance on all sides from other buildings it was except from the primary fire limits restrictions. Brian told us to send you the site plans for that purpose.

I've cc'd both of them in my reply so we can all be on the same page.

Thank you for your continued assistance.

Chaz Browning
Deputy Chief / Fire Marshal
(336)480-5996 cell
(336)734-2490 office
Charlesb@cityofws.org

On Aug 4, 2023, at 15:42, Rittlinger, David B <david.rittlinger@ncdoi.gov> wrote:

Chaz,
Good afternoon.

Enclosing the playground in Type IB construction and providing an NFPA 13 automatic fire sprinkler system does eliminate the issue with 2018 NCBC D102.2.9 since the playground is now within the building.

D102.2.9 Roof structures.

Structures, except aerial supports 12 feet (3658 mm) high or less, flagpoles, water tanks and cooling towers, placed above the roof of any building within the fire district shall be of noncombustible material and shall be supported by construction of noncombustible material.

The materials shall be non-combustible per 2018 NCBC 703.5, 703.5.1 and 703.5.2.

703.5 Noncombustibility tests.

The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term "noncombustible" does not apply to the flame spread characteristics of *interior finish* or *trim* materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.5.1 Elementary materials.

Materials required to be noncombustible shall be tested in accordance with ASTM E136.

703.5.2 Composite materials.

Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a *flame spread index* not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible materials.

The use of sprayed fire-resistant materials can be used such as flame-retardant coatings per 2018 NCBC 704.13.

704.13 Sprayed fire-resistant materials (SFRM).

Sprayed fire-resistant materials (SFRM) shall comply with Sections 704.13.1 through 704.13.5.

704.13.1 Fire-resistance rating.

The application of SFRM shall be consistent with the *fire-resistance rating* and the listing, including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions and the use of bonding adhesives, sealants, reinforcing or other materials.

704.13.2 Manufacturer's installation instructions.

The application of SFRM shall be in accordance with the manufacturer's installation instructions. The instructions shall include, but are not limited to, substrate temperatures and surface conditions and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

704.13.3 Substrate condition.

The SFRM shall be applied to a substrate in compliance with Sections 704.13.3.1 through 704.13.3.2.

704.13.3.1 Surface conditions.

Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale and any other condition that prevents adhesion. The substrates shall be free of primers, paints and encapsulants other than those fire tested and *listed* by a nationally recognized testing agency. Primed, painted or encapsulated steel shall be allowed, provided that testing has demonstrated that required adhesion is maintained.

704.13.3.2 Primers, paints and encapsulants.

Where the SFRM is to be applied over primers, paints or encapsulants other than those specified in the listing, the material shall be field tested in

---

704.13.4 Temperature.

A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for not fewer than 24 hours after the application of the SFRM, unless the manufacturer's instructions allow otherwise.

704.13.5 Finished condition.

The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids, spalls, delamination or any exposure of the substrate. Surface irregularities of SFRM shall be deemed acceptable.

I think that as long as the flame-retardant coatings are provided for the wood structure and members and this flame-retardant coating was suitable for the application on a playground per the manufacturer's installation instructions and all other materials met the non-combustibility criteria of 2018 NCBC 703.5, then the intent the code is met.

Please let me know your thoughts on this.
Thank you for your work on this.

David B. Rittlinger, PE, LEED AP
Code Interpretations Supervisor
Chief Code Consultant
Engineering Division

N.C. Department of Insurance
Office of State Fire Marshal
1429 Rock Quarry Road, Suite 105
Raleigh, NC 27610
919.647.0008
david.rittlinger@ncdoi.gov

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From: Rittlinger, David B
Sent: Friday, August 4, 2023 2:52 PM
To: Chaz Browning <charlesb@cityofwsfire.org>
Cc: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>
Subject: RE: [External] Kaleideum Site Plan

Chaz,
Good afternoon.
My apologies for the delay in the response.
Our office has been involved in two major conferences this week and so staff has been only sporadically available. We are reviewing the information now. I hope to provide a response to you later today, but Monday is more likely.

Let me know if you have any questions.
Thank you for your patience.

<image007.png>
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
https://codes.iccsafe.org/codes/north-carolina

From: Chaz Browning <charlesb@cityofwsfire.org>
Sent: Friday, August 4, 2023 10:55 AM

To: Rittlinger, David B <david.rittlinger@ncdoi.gov>
Cc: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>
Subject: Re: [External] Kaleideum Site Plan

David,

Just checking in with you. Any update on reviewing the Kaleideum site plan?

Chaz Browning
Deputy Chief / Fire Marshal
(336)480-5996 cell
(336)734-2490 office
Charlesb@cityofws.org

On Jul 28, 2023, at 13:26, Rittlinger, David B <david.rittlinger@ncdoi.gov> wrote:

Cory,
Good afternoon.
Thank you for sending the site plan.
Our staff is evaluating code compliance further based on the proposed options.
I will try to provide a response later this afternoon, but over the weekend or Monday is more likely.
We are certainly going to respond as soon as possible on this issue.
Thank you for your patience.
Have a good day.

<image007.png>
david.rittlinger@ncdoi.gov

Link to free view of 2018 NC Codes
https://codes.iccsafe.org/codes/north-carolina

From: Cory Lambert <CORYML@CITYOFWSFIRE.ORG>
Sent: Thursday, July 27, 2023 3:33 PM
To: Rittlinger, David B <david.rittlinger@ncdoi.gov>; Johnson, Charlie E <charlie.johnson@ncdoi.gov>
Cc: Chaz Browning <charlesb@cityofwsfire.org>
Subject: [External] Kaleideum Site Plan

Gentlemen,

Chief Browning asked me to send you the site plan for Kaleidium Museum. Let me know what other pages you might need. The entire plan set is 297 pages; I am happy to pull out any other specific pages if needed.

Cory Lambert, CFI
Assistant Fire Marshal
Winston-Salem Fire Department
coryml@cityofwsfire.org
Office: 336-747-7359

Bryce A. Stuart Municipal Building
100 East First St
Winston-Salem, NC 27102