October 11, 2023

Trillas Consulting Engineers
7850 NW 146th Street – Suite 506
Miami Lakes, FL 33016

Dr. John Francavilla
Net Zero Building System, Inc.
7980 Jack James Road
Stuart, FL 34997

RE: CFS Building System for Construction of Single-Family Homes in High Wind and Seismic Prone Areas

Dear Dr. Francavilla

Trillas Consulting Engineers (TCE) has completed a review of the Net Zero Building Systems, Inc's known as Spray Rock (www.sprayrock.com) (NZBS) for use as the main lateral force resisting system of a single-family home within a high wind and seismic prone area. Based on our knowledge in designing numerous projects throughout the United States and the Caribbean using similar building materials, an extensive experience in performing forensic evaluations on similar buildings throughout the United States and the Caribbean, our review of the structural testing performed on the aforementioned building system, TCE's in-depth research conducted over several years regarding the application of cold formed steel building systems within high wind and seismic prone regions, and a thorough product specific comparison analysis; the use of the NZBS will reduce the overall seismic base shear force resistance requirement of conventional cast-in-place concrete with concrete masonry walls single family home by approximately 64%, and reduce the overall gravity dead load of the structural system by approximately 50%, which would yield a reduction in the structural foundation system. Furthermore, the use of NZBS as the main force resisting system of a building within a high wind and seismic region has numerous other advantages, listed below:

- Ductile material making it optimal to dissipate energy inflicted on the building by an earthquake and/or high wind event.
  - Energy is dissipated without permanent deformation or damage to the steel. [3]
  - Composite System: CFS Studs with Concrete Sheathing [1]
    - Considerably increases lateral stiffness.
    - Improves the ductility of the overall structure.
  - Energy dissipated within the CFS frame reducing the cracking and damage of the concrete layer within the NZBS. [1]
    - This is because some energy is dissipated through the bonding slip between the CFS frame and the concrete layer.
- Rated for wind speeds of 250+ mph.
  - Tests performed by Blackwater Technical Services, Inc., Blackwater Testing, Inc., & American Test Lab of South Florida
    - Testing of the product reached up to 367 mph before it was terminated.
- CFS is one of the lightest framing materials used in construction today. [3]

- Strength-to-Weight Ratio [3]
    - CFS has the highest ratio of all commonly used building materials.
- Superior strength of connections. [3]
- Non-combustible building material. [4] [5]
    - Numerous fire rated approved assemblies per ASTM E119
- Building tolerances are plumb and precise to the nearest 1/64”
    - Interior finishes construction will be a smoother process.
- Environmental Impact
    - CFS is a 100% recyclable material.
    - Superior thermal performance
        - NZBS Wall’s R-value = 12.0 (8” Concrete Wall R-Value = 1.6)
        - 750% increase

Based on our analysis, it is our professional opinion that the Spray Rock Building System proposed for single-family homes constructed within high wind and seismic prone regions is a suitable structural system and provides a more economically efficient, eco-friendly, and faster construction option as opposed to the conventional cast-in-place concrete with concrete masonry walls.

Except as expressly provided herein, no additional affirmations or certifications are intended. Thank you for your consideration of the above. Should you have any questions, please do not hesitate to contact our office.

Respectfully,

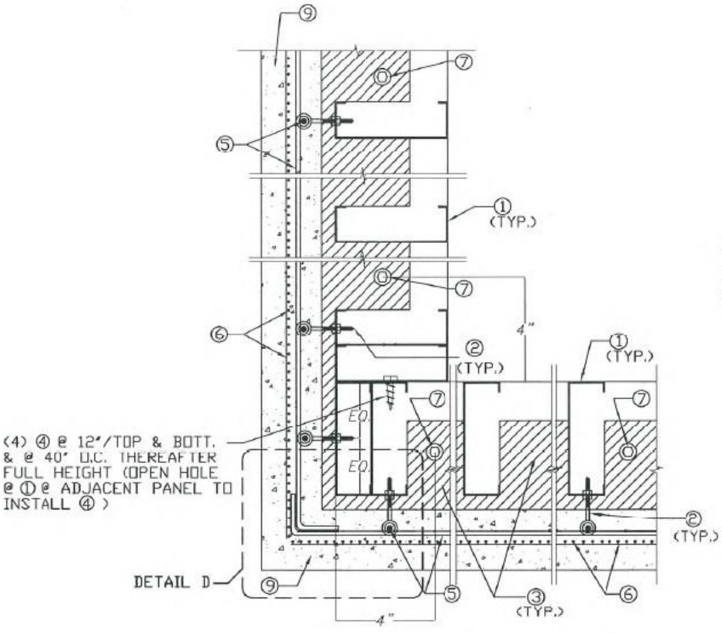
Eric F. Trillas, P.E., S.I.
FL PE #77860
FL SI #77860

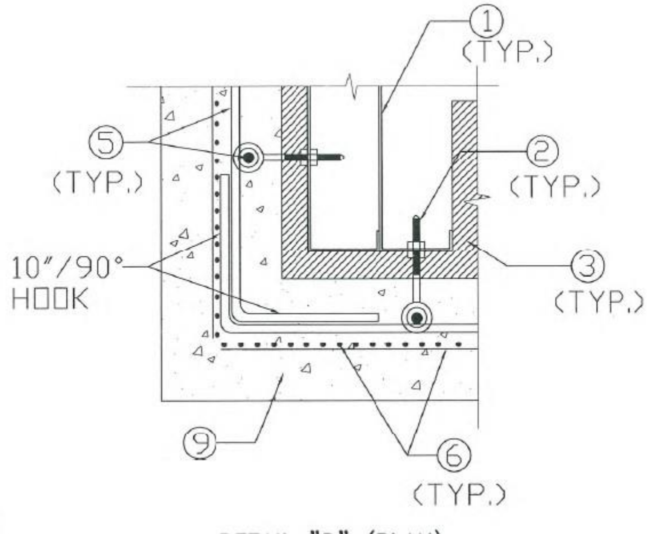
Attached: TCE Comparison Analysis
NZBS Product Approval #23-0221.08
Eric F. Trillas CV

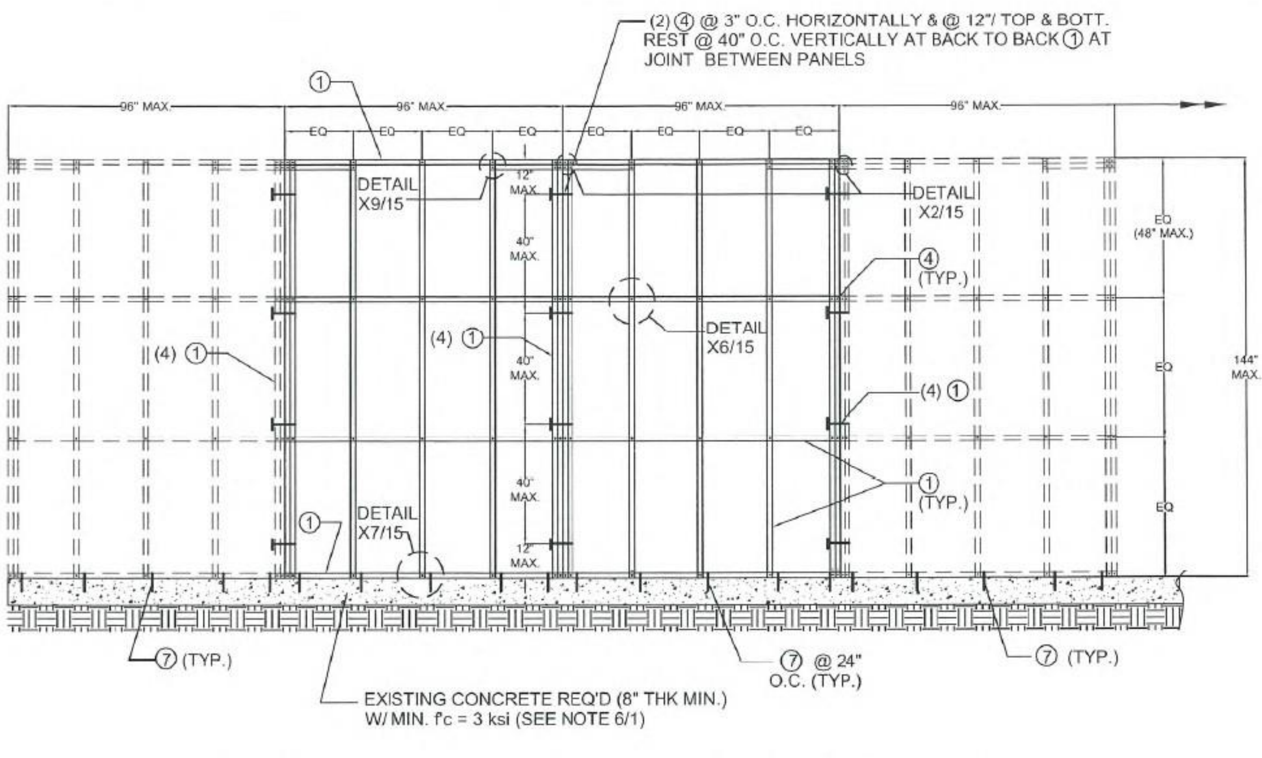
Building System Comparison Analysis

Building System Benefits

- Spray Rock Building System Construction







TYPICAL MULTIPLE SOLID PANELS FRAMING

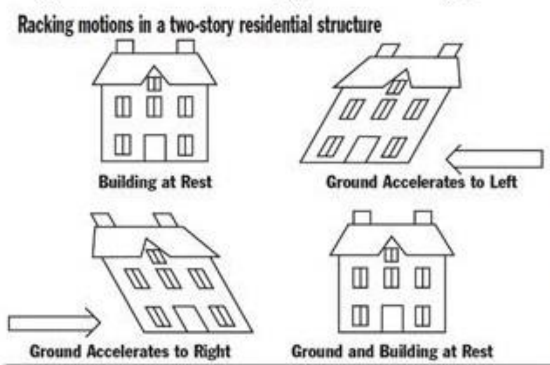
- **Energy Dissipation** [1]

4.6. Energy absorption

The energy absorption is given by the area under the envelope curve, that is, the load–displacement curve. Table 6 lists the energy absorptions of the different test specimens at the ultimate displacement. Although the results for the ultimate point (Δ_u, P_u) obtained by the methods recommended by AISI [1] and ECCS [36] differ, the differences between the amounts of energy absorbed as calculated by the two methods is relatively small, as shown in Fig. 23. Comparison of the energy absorptions of the different test specimens revealed the following: (1) The energy absorptions of Specimens W-KB-1 and W-XB-1 were 5.5 and 2.4 times those of Specimens F-KB and F-XB, respectively. The energy absorption of CFS-framed shear walls with SLM layers is therefore evidently superior to that of simple steel frames. This is because some energy is dissipated through the bonding slip between the CFS frame and an SLM layer. (2) Because the fitting of X-shaped bracings in CFS walls increases the axial force acting on the end studs, which are prone to local buckling, the energy absorption can be reduced by 24.9–35.9%. (3) The relatively weak strength of the screw connections between the CSB panels and the steel frame caused the energy absorption of the Type C wall specimens to be slightly lower than those of the specimens with SLM sheathing on both sides.

- **Product Ductility** [3]
-

Seismic. Earthquakes are one of the most destructive forces in nature. In recorded history, single seismic events have altered the course of major rivers, erased significant areas of land from the map and devastated structures within a considerable distance of the earthquake's epicenter. Buildings in high-seismic zones are designed to absorb energy produced by ground movement by "flexing" or "deflecting" in varying degrees, depending upon the construction materials, design of the structure, quality of construction, level of engineering, and the applicable building code requirements. Cold-formed steel is the ideal material for buildings design to withstand seismic forces for two key reason: high ductility and light weight. Steel is considered a ductile material because it has the ability to bend or stretch without breaking when a force is applied. As the load is reduced, the energy is dissipated without permanent deformation or damage to the steel. On the other hand, brittle materials like concrete or masonry units will fracture and fail at their ultimate loads. The weight of a building will be heavily influenced by the structural system, and cold-formed steel is one of the lightest framing materials used in construction today. Structural damage is typically caused by "inertia", or the reluctance of upper stories to begin moving as the ground shifts, and then conversely, to stop moving once the structure has moved. In a seismic event, the effect on a structure is similar to what players experience in the game "crack the whip." Lighter structures have less weight available to be subjected to the stresses of inertia.



- **Strength-to-Weight Ratio** [3]

Strength-to-Weight Ratio: A key characteristic of resilient building materials is the strength-to-weight ratio. This relatively easy way to compare the merits of several different materials is determined by dividing the maximum imposed load by the weight of the material. Of all commonly used construction materials, steel has the highest strength-to-weight ratio. When cold-formed steel sheet is formed into a C-shape, like a stud, the bends act as stiffeners and increase the strength of the steel sheet dramatically, providing a strength-to-weight ratio that is up to seven times greater than that of dimensional lumber.

- **Fire Resistant** [3]

    - Cold-formed steel is a "non-combustible" building product

Fire. The building codes recognize cold-formed steel as "non-combustible" and therefore make it eligible for use in Type I buildings where the fire-resistance standards are the most stringent. This is because cold-formed steel does not burn and will not contribute to the spread or intensity of a fire. Research has also set the melting point of steel at approximately 2700°F, which means that is will not melt in a building fire, where temperatures average 1000°F and almost never exceed 1800°F. And while the yield strength of steel is reduced at elevated temperatures, modern building codes and fire protection methods take this into account.

Engineering Analysis Comparison Analysis

Typical Project Design Specification

DESIGN CRITERIA:

CODES AND STANDARDS

OECS BUILDING CODE 2016
INTERNATIONAL BUILDING CODE (IBC) 2012
ASCE7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
AMERICAN CONCRETE INSTITUTE (ACI) 318-11
ACI DETAILING MANUAL 2004

LOADS

DEAD LOADS

NORMAL WEIGHT CONCRETE	- 150 pcf
8" CMU	- 50 psf
CEILINGS, PARTITIONS, FLOOR FINISH	- 30 psf
ROOF ASSEMBLY	- 30 psf

LIVE LOADS

FLOOR LIVE LOAD	- 40 psf
STORAGE	- 125 psf
STAIRS	- 100 psf
ROOF LIVE LOAD	- 20 psf

SEISMIC DESIGN CRITERIA (IBC 2012)

Ss	- 1.513g
S1	- 0.457g
SOIL SITE CLASS	- D
Fa	- 1.00
Fv	- 1.54
RISK CATEGORY	- II
IMPORTANCE FACTOR	- 1
SEISMIC DESIGN CATEGORY	- D
STRUCTURAL SYSTEM	- BEARING WALL SYSTEM WITH SPECIAL RC WALLS
RESPONSE MODIFICATION FACTOR, R	- 5.0
DEFLECTION AMPLIFICATION FACTOR, C/d	- 5.0

WIND DESIGN CRITERIA (ASCE7-10)

BASIC WIND SPEED	- 160 mph
CLIMATE CHANGE FACTOR (OECS 1202.2c)	- 1.13
BUILDING CLASSIFICATION	- II
EXPOSURE CATEGORY	- D
TOPOGRAPHIC FACTOR, Kzt	- 1
DIRECTIONALITY FACTOR. Kd	- 0.85
GUST EFFECT FACTOR, G	- 0.85
Cp (WINDWARD, LEEWARD, SIDE, ROOF)	- 0.80, -0.50, -0.70, -0.90
INTERNAL GCpi	- ±0.18

Figure 1. Typical Design Criteria Specific to Single-Family Homes Constructed Using Conventional Cast-in-Place Concrete and Concrete Masonry Infill Walls

Foundation System Requirements

- The weight of building components (Dead Load) plays a major role in the design of foundations systems.
- Building Weight Comparison of Concrete/CMU v. CFS walls:

Normal Weight of Concrete (8” walls)	100 lb/ft^2
8” CMU Block Wall	50 lb/ft^2
Spray Rock Building System	49 lb/ft^2

- Based on typical single family home with approximately 16,000 ft^2 of walls:
  - Total of 16,000 ft^2 of cast-in-place walls
  - Total Dead Load = 1,600,000 lb
  - Spray Rock Building System
    - Total Dead Load = 784,000 lb
    - **<u>51% reduction in building weight</u>**

- Building Weight Comparison of Concrete/CMU v. CFS floor systems:

Normal Weight of Concrete (8” slab)	100 lb/ft^2
<u>Option #1</u>	
Spray Rock Building System	12 lb/ft^2
Sheathing (Mag Board)	4 lb/ft^2
<u>Option #2</u>	
Spray Rock Building System	12 lb/ft^2
Composite Metal Deck	35 lb/ft^2

- Based on a typical 5,000 ft^2 Single Family Home:
  - Total of 5,000 ft^2 of concrete slabs
  - Total Dead Load = 500,000 lb
  - Spray Rock Building System
    - Option #1
    - Total Dead Load = 80,000 lb
    - **<u>84% reduction in building weight</u>**

    - Option #2
    - Total Dead Load = 235,000 lb
    - **<u>53% reduction in building weight</u>**

Typical Seismic Design Criteria

- Concrete/CMU Building:

SEISMIC DESIGN CRITERIA (IBC 2012)

Ss	-	1.513g
S1	-	0.457g
SOIL SITE CLASS	-	D
Fa	-	1.00
Fv	-	1.54
RISK CATEGORY	-	II
IMPORTANCE FACTOR	-	1
SEISMIC DESIGN CATEGORY	-	D
STRUCTURAL SYSTEM	-	BEARING WALL SYSTEM WITH SPECIAL RC WALLS
RESPONSE MODIFICATION FACTOR, R	-	5.0
DEFLECTION AMPLIFICATION FACTOR, C/d	-	5.0

- Spray Rock Building System
  - The following factors would remain the same:
    - S_s
    - S_1
    - Soil Site Classification
    - F_a
    - F_v
    - Risk Category
    - Importance Factor
    - Seismic Design Category
    - Deflection Amplification Factor

  - The following factors would change using the Spray Rock Building System:
    - Structural System
      - Steel Special Concentric Braced Frames
    - Response Modification Factor, R
      - R = 6.0

  - Increased R value would reduce required shear load design of building. See next section.

Seismic Load Design Calculation

- Base Shear Formula

12.8.1 Seismic Base Shear The seismic base shear, V, in a given direction shall be determined in accordance with the following equation:

$$V = C_s W \qquad (12.8\text{-}1)$$

where

C_s = The seismic response coefficient determined in accordance with Section 12.8.1.1, and
W = The effective seismic weight per Section 12.7.2.

$$C_s = \frac{S_{DS}}{\left(\frac{R}{I_e}\right)} \qquad (12.8\text{-}3)$$

- Concrete/CMU Building System:
  - Using values from previous section:
  - S_{ds}= 2/3*S_{ms} = 1.009
  - R = 5.0
  - I_e = 1.0
  - C_s = 0.202
  - Assuming W = 2,100,000 lb (weight of walls and floor systems)
  - V = 424,200 lb (Shear Force)

- Spray Rock Building System:
  - Using values from previous section:
  - S_{ds}= 2/3*S_{ms} = 1.009
  - R = 6.0
  - I_e = 1.0
  - C_s = 0.168 (16.8% Reduction)
  - Assuming W = 1,019,000 lb (weight of walls and floor systems)
  - V = 171,192 lb (Shear Force)
  - **60% reduction in seismic load**

Typical Wind Design Criteria

WIND DESIGN CRITERIA (ASCE7-10)

BASIC WIND SPEED	-	160 mph
CLIMATE CHANGE FACTOR (OECS 1202.2c)	-	1.13
BUILDING CLASSIFICATION	-	II
EXPOSURE CATEGORY	-	D
TOPOGRAPHIC FACTOR, Kzt	-	1
DIRECTIONALITY FACTOR. Kd	-	0.85
GUST EFFECT FACTOR, G	-	0.85
Cp (WINDWARD, LEEWARD, SIDE, ROOF)	-	0.80, -0.50, -0.70, -0.90
INTERNAL GCpi	-	±0.18

- Spray Rock Building System
  - Rated for 250+ mph

Perm. Set Location	1	2	3	4	5
Span, (in.)	24	24	24	119	47
Maximum Perm. Set Measured, (in.) Test, - 240 psf / 30 sec.	-0.007	0.089	0.001	0.328	0.175
Maximum Allowable Perm. Set, (in.), (L x .4%)	0.096	0.096	0.096	0.476	0.188
Results:	Pass	Pass	Pass	Pass	Pass

(- 230 psf = wind speed 299.7)
Note: + half test, design and test were not conducted since the decision to test to 230 psf was not made until the negative loading had started. Due to side fastener pull-out at the -345 psf load, (approximate wind speed 367 mph) , the test was terminated.

References

1. Performance of cold-formed-steel-framed shear walls sprayed with Light weight mortar under reversed cyclic loading. Bin Liu, Ji-Ping Hao, Wei-Hui Zhong, HaoWang. 2015

2. Lateral behaviour of hybrid cold-formed and hot-rolled steel wall systems: Experimental investigation. Mina Mortazavi, Pezhman Sharafi, Hamid Ronagh, Bijan Samali, Kamyar Kildashti. 2018

3. Steel Framing Industry Association (SFIA) – About Cold Formed Steel – Strong and Resilient) https://sfia.memberclicks.net/index.php?option=com_content&view=category&id=22&layout=blog&Itemid=116&limitstart=5#:~:text=Cold-formed.

4. International Building Code – Building & Residential

5. American Society for Testing and Materials (ASTM), Standard Test Methods for Fire Tests of Building Construction and Materials., ASTM E119-20, West Conshohocken, USA, 2020.

6. American Society for Testing and Materials (ASTM), Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Walls for Buildings, ASTM E2126-07, West Conshohocken, USA, 2007.

7. ASCE "American Society of Civil Engineers" Minimum Design Loads for Buildings and Other Structures (ASCE 7).

8. American Iron and Steel Institute (AISI), North American Standard for Cold Formed Steel Framing Lateral Design, AISIS213, Washington, DC, USA, 2007.

9. Earthquake Response of Cold-Formed Steel-Based Building Systems: An Overview of the Current State of the Art. Gianmaria Di Lorenzo and Attilio De Martino. 2019

GENERAL NOTES:

1. THIS PRODUCT APPROVAL DOCUMENT (P.A.D.) APPLIES TO TH£ STRUCTURAL WALL PANELS IND/CAT£D AND SP£CIFI£D ON THIS ORAWING, WHICH HAV£ 8££N VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE **2020 (7th EDITION)** & **2023 (8th EDITION)** OF THE FLORIDA BUILDING CODE.

   DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION **1620** OF THE ABOVE MENTIONED CODE, USING **ASCE 7-16-(Fl!ie 2020) • A5CE 7-22 {FBC 2023)** FOR INSTALLATIONS AND SHALL NOT EXCEED THE MAXIMUM {A.S.D.) DESIGN PRESSURE RATINGS & LOAD CAPACITIES INDICATED ON THIS SHEET.

   IN ORDER TO VERIFY THE ABOVE CONDITION, ULTIMATE DESIGN WIND LOADS DETERMINED PER ASCE 7-16 & ASCE 7-22 SHAU BE FIRST REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE W/ MAX. (A.S.D.) DESIGN PRESSURE RATINGS & LOAD CAPACITIES INDICATED ON THIS SHEET.

   DESIGN DEAD AND LIVE LOADS SHALL BE D£TERMIN£D IN ACCORDANCE WITH SECTION **1616** OF THE FLORIDA BUILDING CODE.

2. BUILDING DIMENSIONS, DETAILS, UPLIFT, OVERTURNING, FOUNDATION, ROOF AND OTH£R ELEMENTS WHERE WALL PANELS WILL BE INSTALLED SHALL BE DESIGNED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AND REVIEWED BY THE STRUCTURAL PLANS EXAMINER OF THE CORRESPONDING BUILDING DEPARTMENT IN ORDER TO /SSU£ A PERMIT FOR CONSTRUCTION.

3. ALL ELECTRICAL, MECHANICAL DETAILS AND PARTS AND FIRE RATING PROVISIONS ARE NOT PART OF THIS APPROVAL AND SHALL BE PREPARED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER AND REVIEWED BY THE CORRESPONDING BUILDING DEPARTMENT IN ORDER TO ISSUE A PERMIT FOR CONSTRUCTION.

4. ALL COMPONENTS FOR THIS PRODUCT SHALL BE AS IND/CATED ON COMPONENTS ON SHEU 3 AND AT BILL OF MATERIALS ON SHEET 2.

5. ALL SCREWS AT COMPONENT # @ SHALL BE CORROSION RESISTANT AS PER DIN 50018 AND SHALL COMPLY W/ FLORIDA BUILDING CODE SECTION 2411.3.3.4.

6. WALL PANEL SYSTEM IS DESIGNED TO BE INSTALLED AS AN EXTERIOR BEARING OR NON BEARING WALL:

6.1 WHEN INSTALLED AS A BEARING WALL, PANEL SHALL BE LATERALLY SUPPORTED BY A CONCRETE SLAB AND FOUNDATION AT THE BOTTOM, AND ROOF TRUSSES OR RAFTERS WITH SHEATHING AT TOP, AT A SPACINGS NOT TO EXCEED 24., ON CENTERS. WALL CONNECTION TO ROOF SYSTEM SHALL 8£ PERFORMED BY A FLORIDA REGIST£R£D PROFESSIONAL ENGIN££R OR ARCHITECT AND REVIEWED BY TH£ STRUCTURAL PLANS EXAMINER OF THE CORRESPONDING BUILDING DEPARTMENT IN ORDER TO ISSU£ A PERMIT FOR CONSTRUCTION. STRUCTURAL DESIGN SHALL INCLUDE PROVISIONS FOR ALL LOADS DEVELOPED AT THE JOINT BETWEEN WALL PANELS AND ROOF SYSTEM.

6.2 WHEN INSTALLED AS A NON BEARING WALL, PANEL SHALL BE LATERALLY SUPPORTED BY CONCRETE SLABS/BEAMS, WOOD OR STEEL STRUCTURAL BEAMS. SPACING BETWEEN LATERAL SUPPORT SHALL NOT TO EXCEED 24" ON CENTERS ON BUILDINGS WITHOUT A CONCRETE SLAB. FOR BUILDINGS WITH CONCRETE SLABS OR CONTINUOS CONCRETE BEAMS, INSTALLATION SHALL BE AS P£R SECTION X-X, SHEET 4. STRUCTURAL ADEQUACY OF EXISTING BUILDING SHALL BE VERIFIED BY THE PERMIT HOLDER.

6.3 MAXIMUM A.S.D. ALLOWABLES: OBTAINED THRU TESTING PERFORMED AS PER -TAS 201, 202, 203 AND ASTM E-72, AS P£R BLACKWATER TESTING INC REPORT# BT-SR-12-001: AND NEW RACKING TEST PER ASTM E-72 PER BLACKWATER TECHNICAL SERVICES INC. REPORT DATED 4/23/2023 - 5/22/2023
LARGE MISSILE IMPACT RESISTANT: 50 FT/SEC. MISSILE SPEED.
MAXIMUM PANEL HEIGHT: 144,.
MAXIMUM PANEL WIDTH: 96" @ SOLID PANELS & 144" @ PANELS W/ OPENINGS.
MAXIMUM A.S.D. COMPRESS/ON LOAD PER PANEL W/ OPENINGS : 10000 Lb (833 Lb/FT)
MAXIMUM A.S.D. COMPRESS/ON LOAD PER SOLID PANEL : 9360 Lb (1170 Lb/FT)
MAXIMUM A.S.D. TENSION LOAD PER PANEL W/ OPENINGS : 10000 Lb (833 Lb/FT}
MAXIMUM A.S.D. TENSION LOAD PER SOLID PANEL : 8800 Lb (1100 Lb/FT)
MAXIMUM A.S.D. RACKING LOAD PER PANEL: 8000 lb (1000 lb/FT)
MAXIMUM LATERAL A.S.D. DESIGN PRESSURE RATING FOR PANELS WITH OR W/0 OPENINGS : ±100.0 psf

6.4 ONLY SOLID PANELS (WITH NO OPENINGS) SHALL B£ CONSIDERED TO RESIST THE RACKING FORCES.

7. COMPONENT 9 SHALL COMPLY W/ AC/ 506 & 318-14 & 318-19 STANDARDS.

8. (a) THIS P.A.D. PREPARED BY THIS ENGINEER IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT; i.e. WHERE THE SITE CONDITIONS DEVIATE FROM THE P.A.D.

   (b) CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT BASED ON THIS P.A.D. PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.

   {c) THIS P.A.D. WILL-BE CONSIDERED INVALID IF MODIFIED.

   (d) SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE PROFESSIONAL OF RECORD {P.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.A.D. PROFESSIONAL OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.A.D. ENGINEER SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC ORAWINGS FOR REVIEW.

   (e} ORIGINAL P.A.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATUR£ OF THE PROFESSIONAL ENGINEER THAT PREPARED IT.

9. A PERMANENT PANEL MANUFACTURER'S LABEL SHALL BE PLACED ON THE EXPOSED SURFACE OF THE PANEL. ONE LABEL SHALL BE PLACED FOR EVERY PANEL. LABEL SHALL COMPLY WITH SECTION 1703.5 OF THE FLORIDA BUILDING CODE.

THIS DRAWING SHALL ONLY 8£ USED TO OBTAIN PERMITS IN TH£ STAT£ OF FLORIDA

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

FLORIDA **BUILDING** CODE (High **Velocity Hurricane Zone)**

hLiEC01Nc.\
TILLIT TESTING & ENGINEERING COMPANY
16355 **H.W.** 36th. St., Ste. 305 - VIRGINIA GARDENS, n. 33166
Phone: {305)871-1530. Fax: {305)871-1531
-m;= ;-COm
WALTER A. TIWT Jr., P.E.
FLORIDA Lie. # 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

REV-N.	DESCRIPTION	DATE	REV-No	DESCRIPTION	DATE
1	<.D 2G-218	07/21/23	5		
2					

W.H.
DRAWN BY:
07/26/2023
DAT£
23-141
DRAWING No
SHEET 1 or 1s

BILL OF MATERIALS

ITEM #	DESCRIPTION	REMARKS
CD	STUD: 16 GAGE ASTM A-653 SQ GRADE 50, G 60 GALVANIZED COLD FORMED STEEL	USE AT ALL FRAME MEMBERS
0	3/8"0 - 16 x 1 1/2" SHOULDER EYE BOLT, W/ 1 1/2" 0.0 EYE & OVERALL LENGTH OF 3 1/2". TPU 40% LONG GLASS-FILLED (BLACK) ISOPLAS PART# 8203-60-741 *W/* 804 lbs TENSION CAPACITY PER INTERTEK REPORT #H8909.01-450-44-RO, DATED 02/06/19	MANUFACTURED BY CRAFTECH INDUSTRIES. MUST BE USED FOR ATTACHMENT TO G)W/@
@	INTERNALLY THREADED 3/8" I.D -16 RIV-NUT, YELLOW ZINC RIBBED 0.027"-0.150" GRIP, LARGE 11/16"0 FLANGE. 1/2" LONG.	1008-1010 ZINC PLATED STEEL.
®	1 LB/FT3 EXPANDED POLYSTYRENE BOARD	SEE DETAIL FOR MIN. DIMENSIONS, MANUFACTURED BY DYPLAST PRODUCTS LLC W/ MIAMI DADE COUNTY PRODUCT APPROVAL.
0	FRAME FASTENER:# 10 **x 3/4" ZINC** PLATED SELF DRILLING SHEET METAL STEEL SCREW	AS MANUFACTURED BY GRABBER CONCORD CA 94520 MODEL # F.P. 101875 LYZ
®	BASAFLEX TM BASALT FIBER REINFORCED POLYMER CORRUGATED REBAR #2 (6mm 0) TENSILE STRENGTH= 163 Ksi, MODULUS OF ELASTICITY= 8.27 Msi, SHEAR STRENGTH= 8 Ksi, DENSITY= 2.63 gr/cm^3	MANUFACTURED BY BASANITE INDUSTRIES LLC. EXCEEDS ACI 440.1R-06. SEE TYPICAL PANEL ELEVATION ON SHEETS 6,7,12 & 13.
®	EXTERIOR WIRE MESH: 14 GAGE (0.075" 0) ASTM A-641 2"x2" G-25 GALVANIZED CARBON STEEL WIRE W/ 60ksi TENSILE STRENGTH	MANUFACTURED BY WIRE PRODUCTS INC OF FLORIDA. TIED TO@)AT LOCATIONS SHOWN ON TYPICAL PANEL ELEVATION ON SHEETS 7, 10 & 13.
0	FILLER SILL ANCHORS: 5/8" 0 x 6" LDT HARDENED CARBON STEEL GRADES ZINC PLATED SELF THREADING CONCRETE SCREW	MANUFACTURED BY RED HEAD, SPACED 24" O.C MAX. W/ 6 3/4" MIN. EDGE DISTANCE FROM LONG EDGE OF SLAB & AT 4" FROM EDGE OF PANEL AND 4 1/2" MIN. EMBEDMENT.
®	REINFORCED GUNITE COVER 3" THK. SPRAYED CONCRETE.	fc=3500 psi@ 7 DAYS & fc=7000 psi@ 28 DAYS. SEE SHEET 2. MUST BE INSTALLED FOLLOWING ACI 560-R GUIDE.
®	WATER PROOFING SELF-ADHERED MEMBRANE W/ MODEL GRACE ICE & WATER SHIELD	LOCATE@ SILL JOINT W/ SLAB, MANUFACTURED BY GRACE, USE ADHESIVE SIDE TO CONCRETE SLAB, USE 7" MIN. WIDE MEMBRANE. SEE DETAIL "Z" ON SHEET 4.

NO. 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zona)

STAND UP WALL SYSTEM

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILUT TESTING & ENGINEERING COMPANY
355 N.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, FL. 33166
Phone : (305)871-1530 • Fax : (305)871-1531
e-mail: tiltecoOaol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Lic. # 44167

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART. FLORIDA 34997
PH: (954) 205-9577

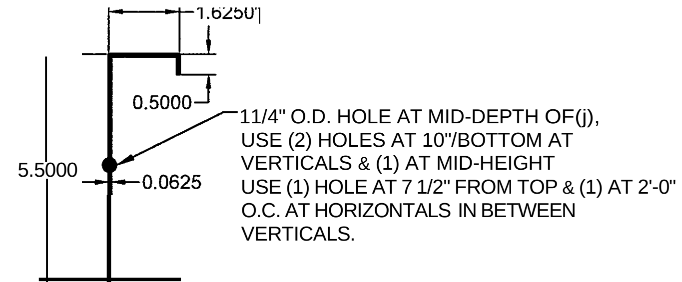
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 20-218	07/21/V.	5	-	
2	-	-	6	-	-
3	-	-	7	-	-
4	-	-	8	-	-

DRAWN BY: W.H.

DATE: 07/26/2023

DRAWING No: 23-141

SHEET 2 OF 15



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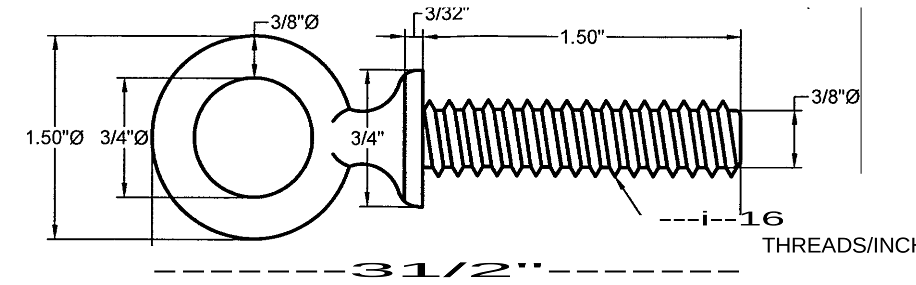
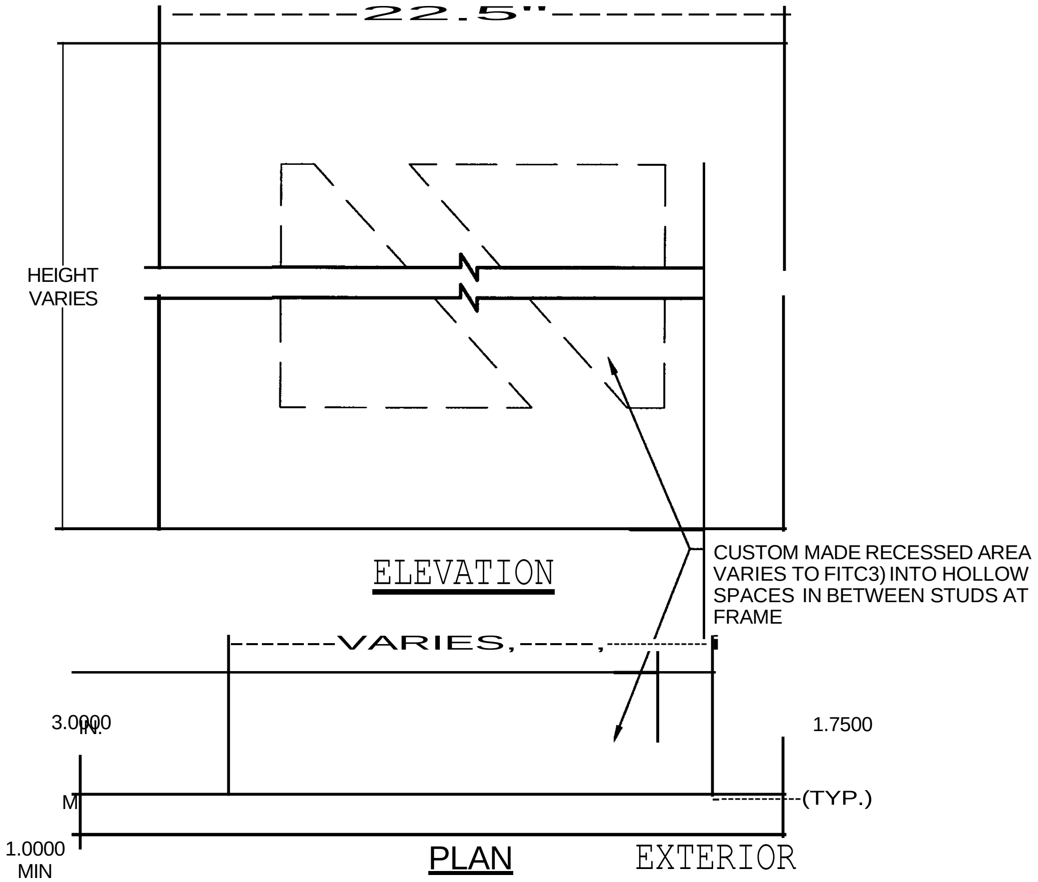
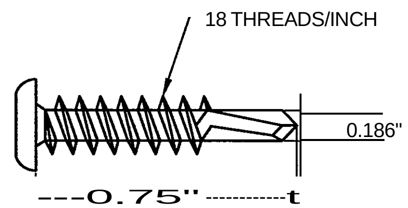


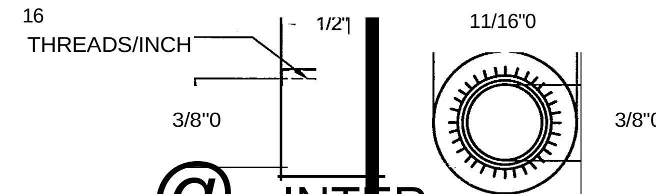
@ 3/8"-16 X 1 1/2"
SHOULDER EYE BOLT
N.T.S



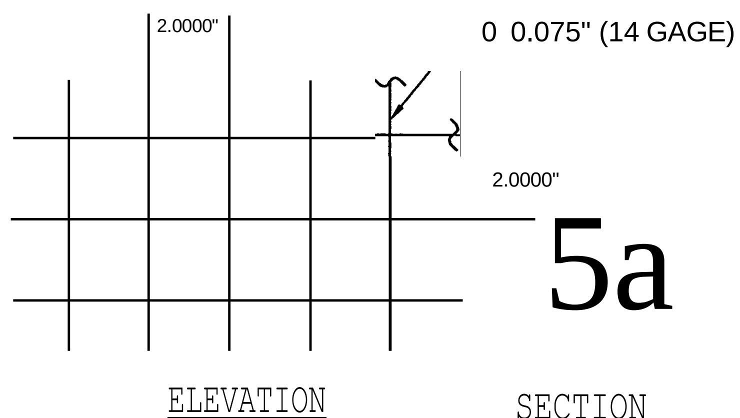
@ EXPANDED POLYSTYRENE BOARD
N.T.S



@) FRAME FASTENER
N.T.S

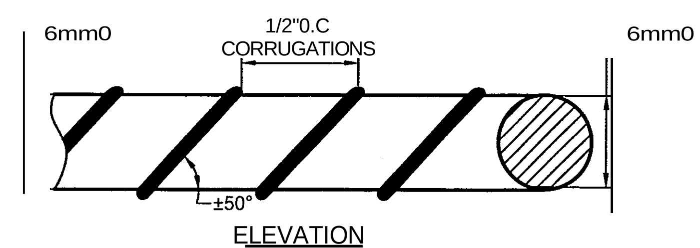


@ INTERNALLY
THREADED RIV-NUT
N.T.S

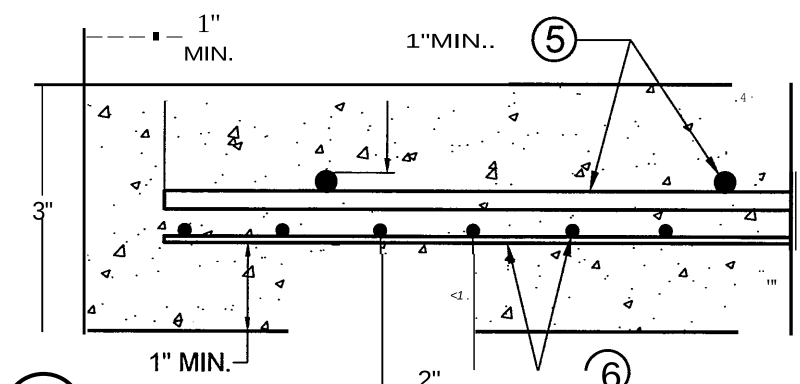


5a

® EXTERIOR WIRE MESH
N.T.S

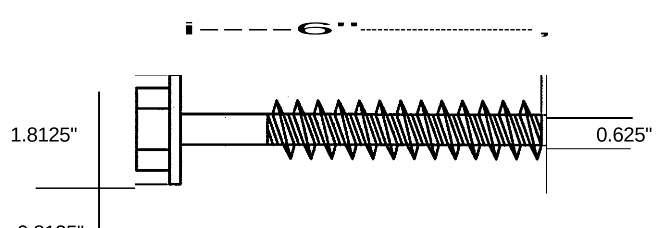


@ BASAFLEX ™ **BFRP**
CORRUGATED REBAR
N.T.S



® REINFORCEDGUNITE COVER
N.T.S

COMPONENTS



(J_) FILLER SILL ANCHOR
N.T.S

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER
7/26/2023

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

TILTECO INC.

365 N.W. 36th St. Ste 305 VIRGINIA GARDENS, FL 33166
TILLIT TESTING & ENGINEERING COMPANY
Phone : (305)871-1530 • rax : (305)871-1531
-moll: lltecoOaol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Uc. # 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

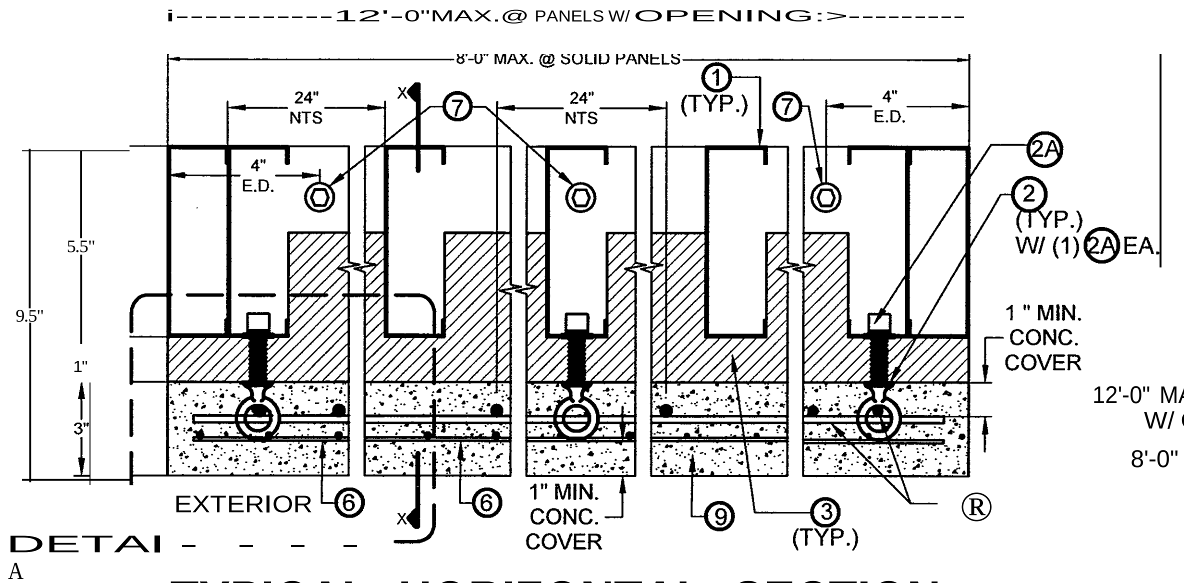
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION
	OLD 20-211	07/21/23	5	

W.H.
DRAWN BY:

07/26/2023
DATE

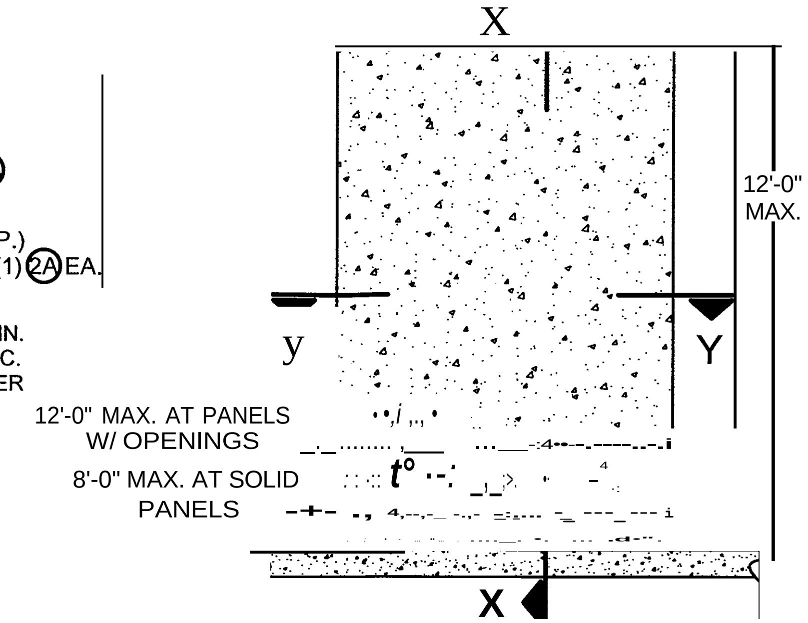
23-141
DRAWING No

SHEET 3 OF 16



TYPICAL HORIZONTAL SECTION Y-Y AT PANEL

N.T.S.



TYPICAL PANEL ELEVATION (EXTERIOR)

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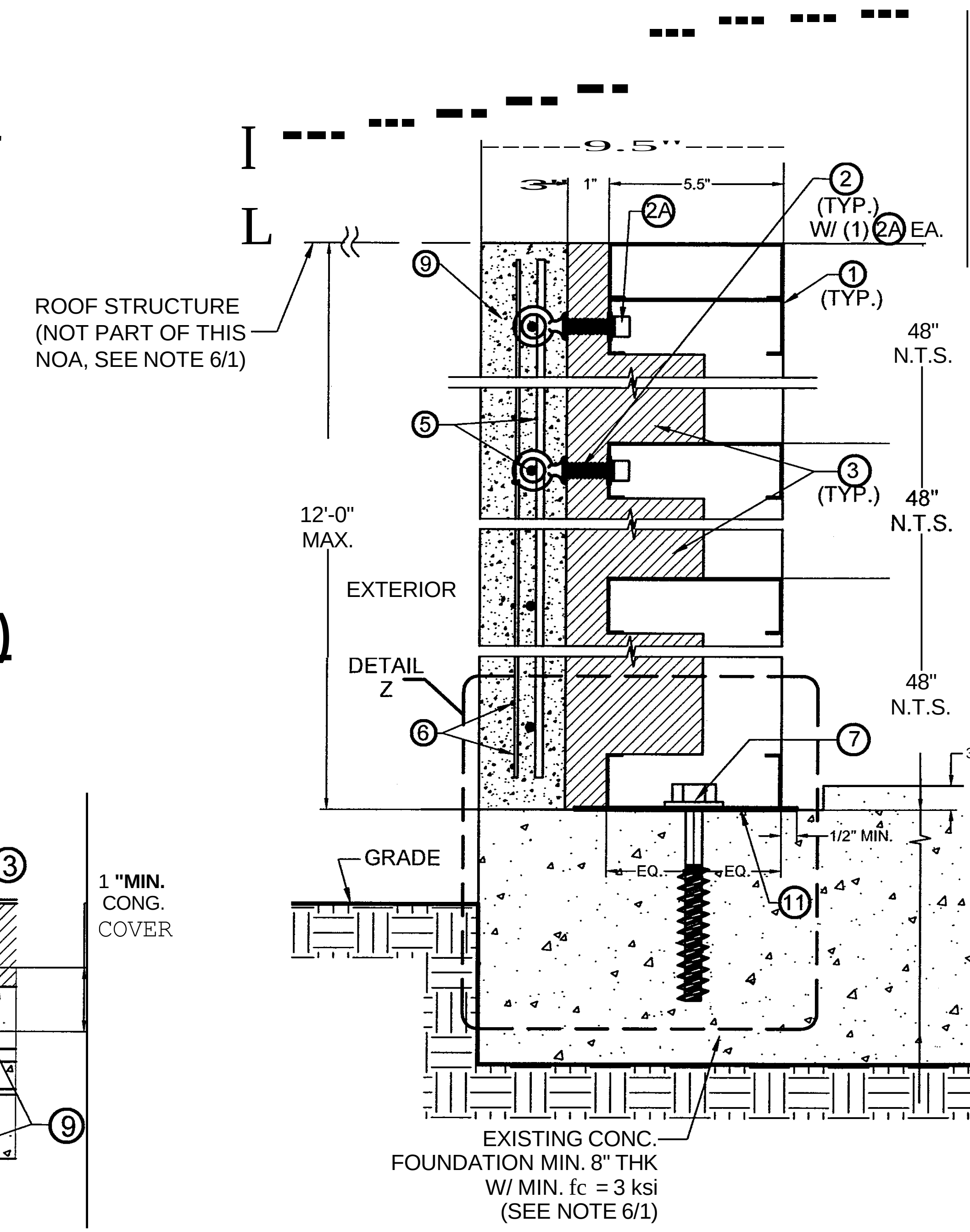

TYPICAL VERTICAL SECTION X-X AT PANEL

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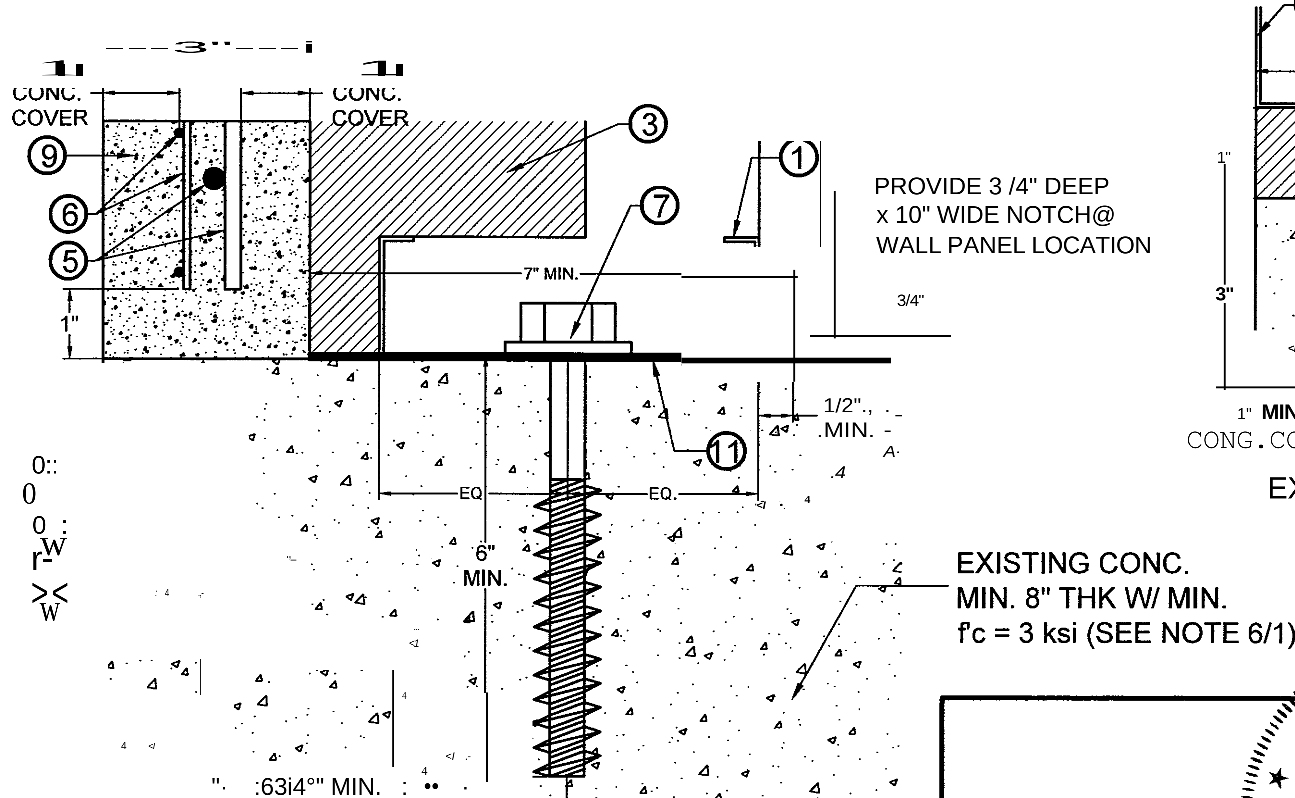

DETAIL "Z"

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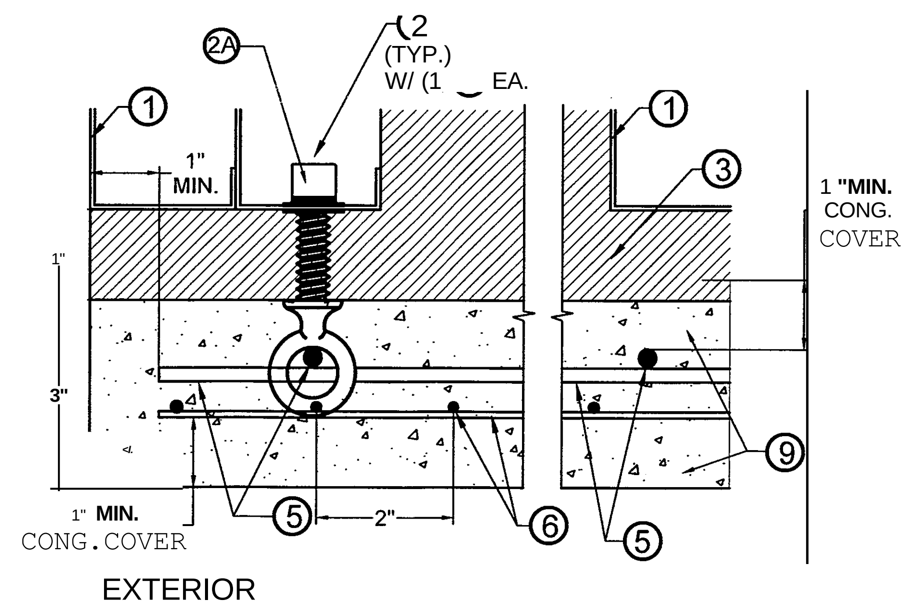

DETAIL "A"

N.T.S.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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07/26/2023
DATE

23-141
DRAWING No

SHEET 4 OF 16

TILTECO INC.

Phone: (305)871-1530 FAX: (305)871-1531
TILLIT TESTING & ENGINEERING COMPANY
355 N.W. 36th St., Ste. 305 VIRGINIA GARDENS, FL 33166
e-mail: tiltecoOaol.com
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WALTER A. TILUT Jr., P.E.
FLORIDA Lic. # 44167

WALTER A. TILLIT JR. LICENSE No 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

MIAMI DADE COUNTY

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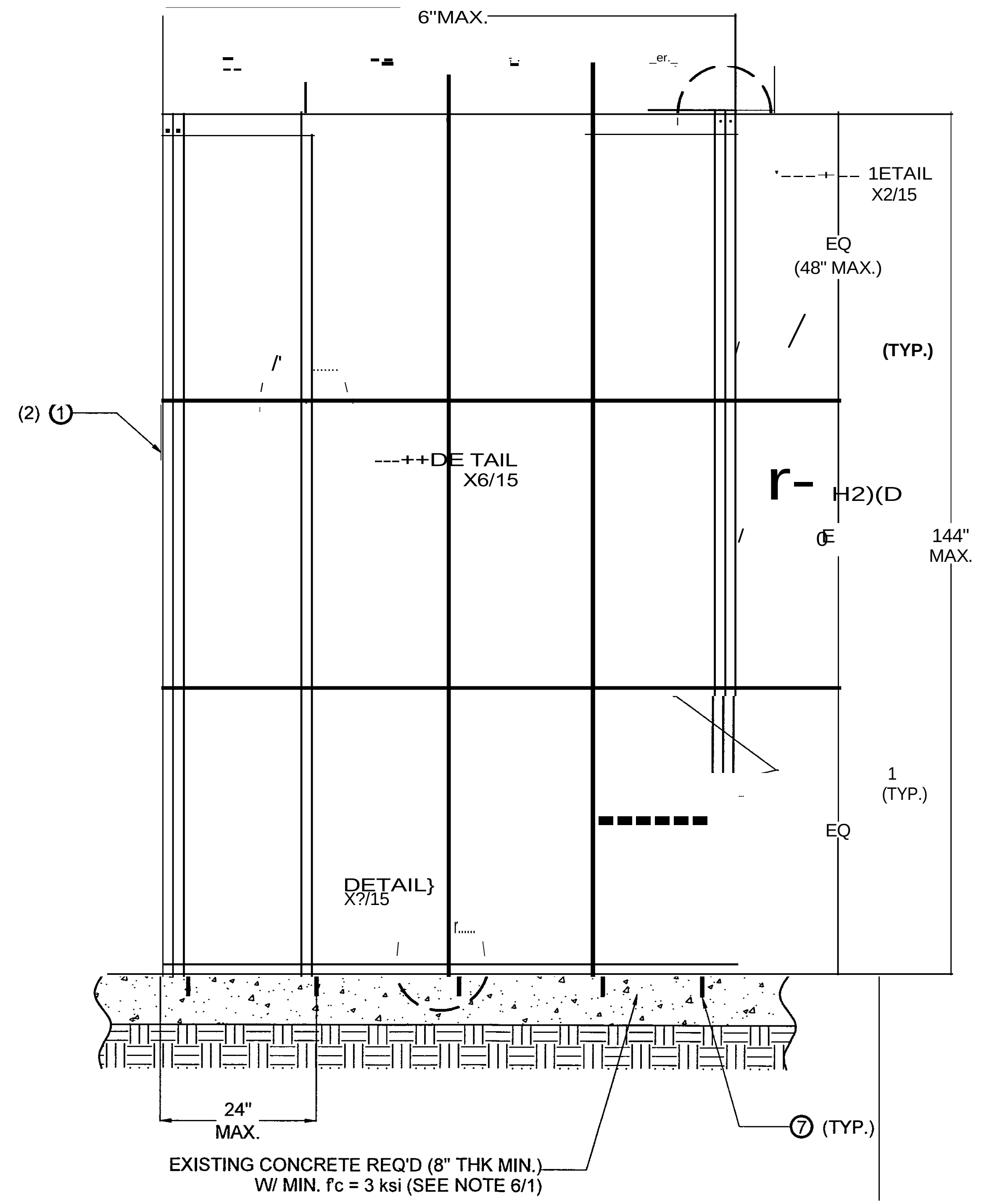

TYPICAL SINGLE SOLID PANEL FRAMING

ELEVATION W/ 1

N.T.S.

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

WALTER A. TILUT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

TILTECO INC.

TILLIT TESTING &: ENGINEERING COMPANY
6355 H.W. 36tt,. St., Ste. 305- VIRCINIA CARDEHS, FL 33166
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tiltecoOaol.cam
CA-0006719
WALTER A. TILUT Jr., P.E.
FLORIDA Lic. # 44167

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NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 20-268	07/26/	5	-	-
2	-	-	6	-	-
3	-	-	7	-	-
4	-	-	8	-	-

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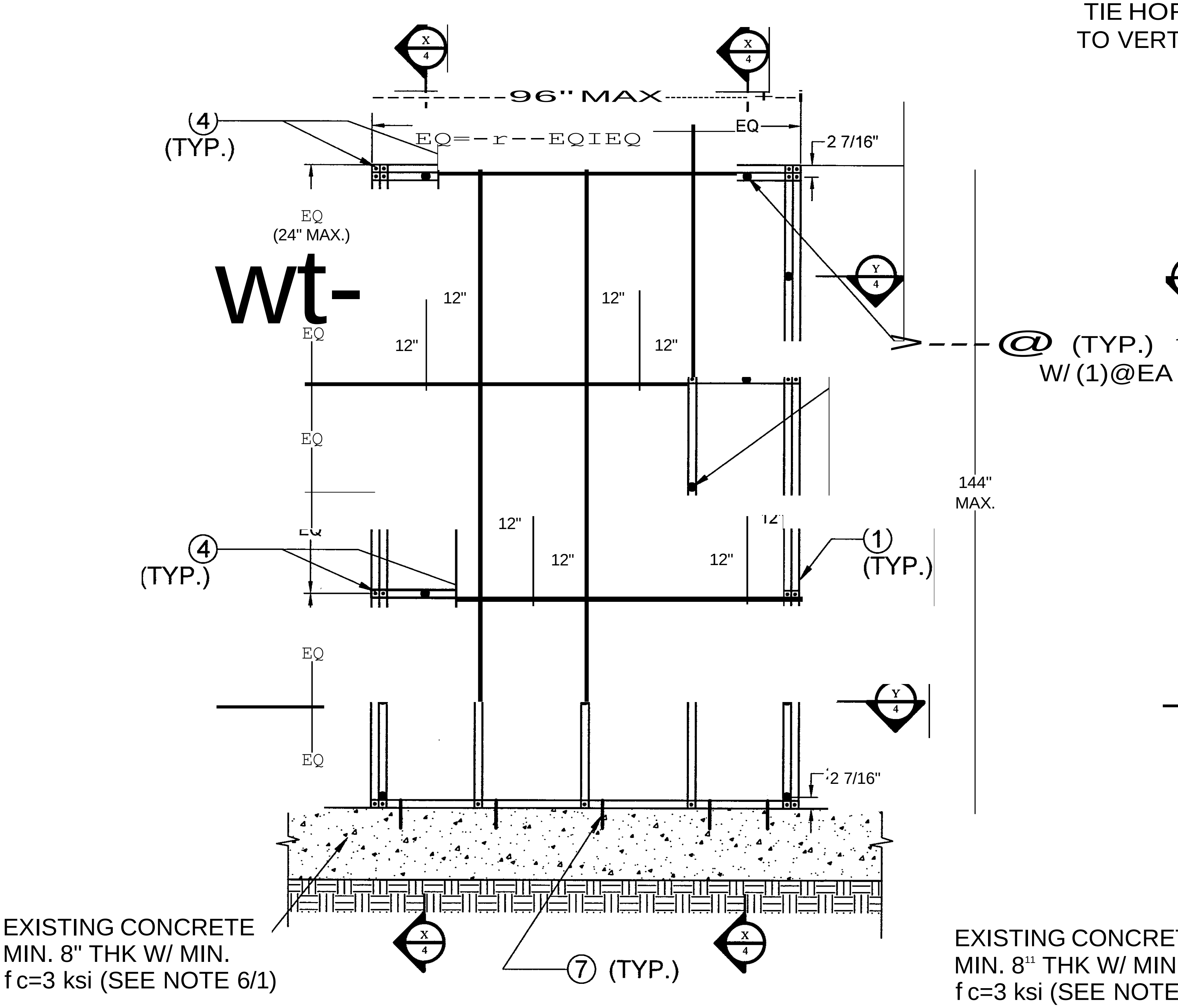
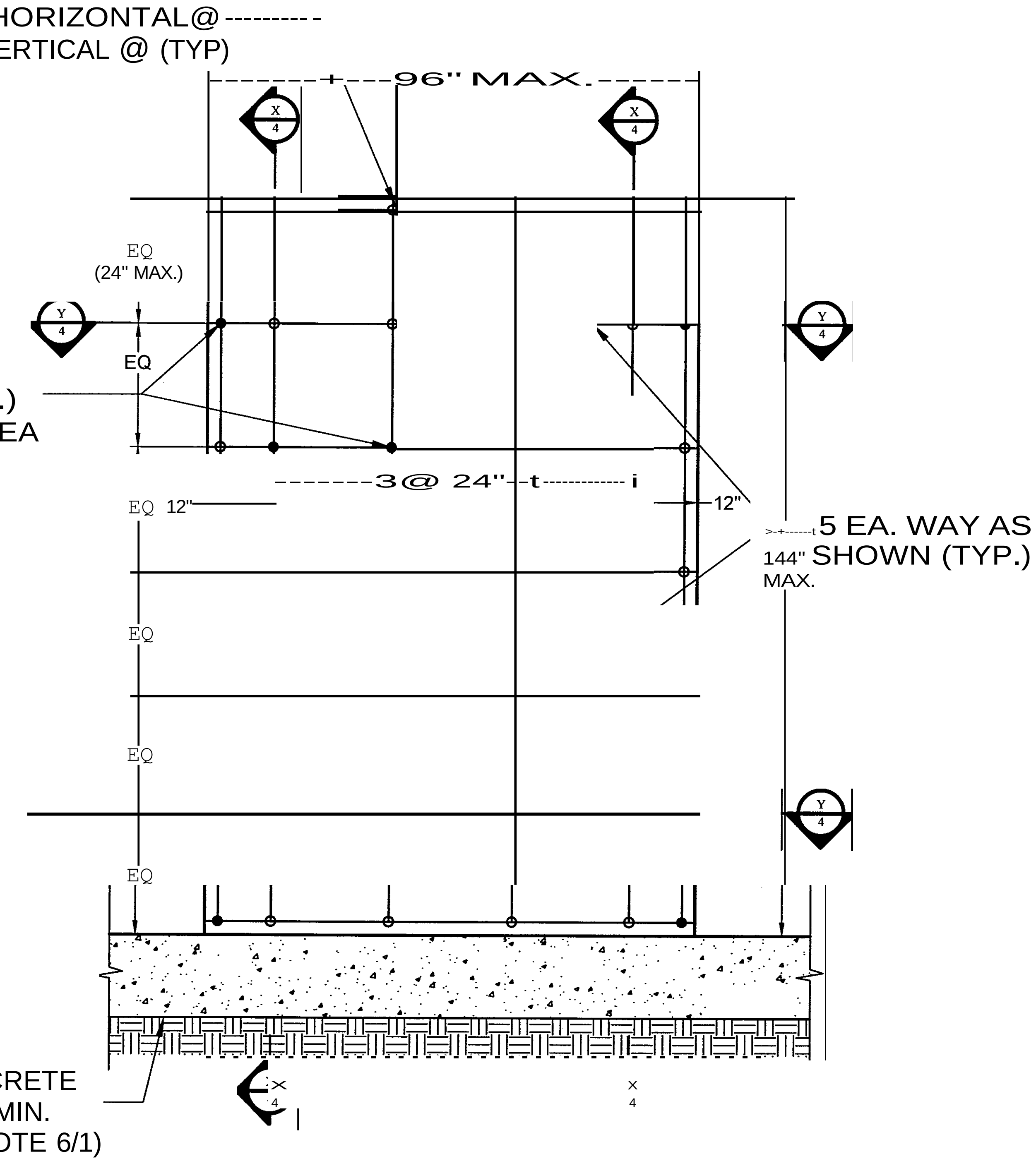
07/26/2023
DATE

23-141
DRAWING No





TYPICAL SINGLE SOLID PANEL ELEVATION WI/ CZ) & @ LAYOUT OVER 1 (EXTERIOR)

N.T.S.

TYPICAL SINGLE SOLID PANEL ELEVATION W/@ LAYOUT OVER@ & CI) & {EXTERIOR)

N.T.S.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.
TILLIT TESTING c!c ENGINEERING CO PANY
5 N.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, FL 33166
Phone: (305)871-1:ml . fOII : (305)871-1531
e-mail: HltecoOaol.com
CA-0006719
WALTER A. TILUT Jr., P.E.
FLORIDA Uc. # «167

STAND UP WALL SYSTEM

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STUART, FLORIDA 34997
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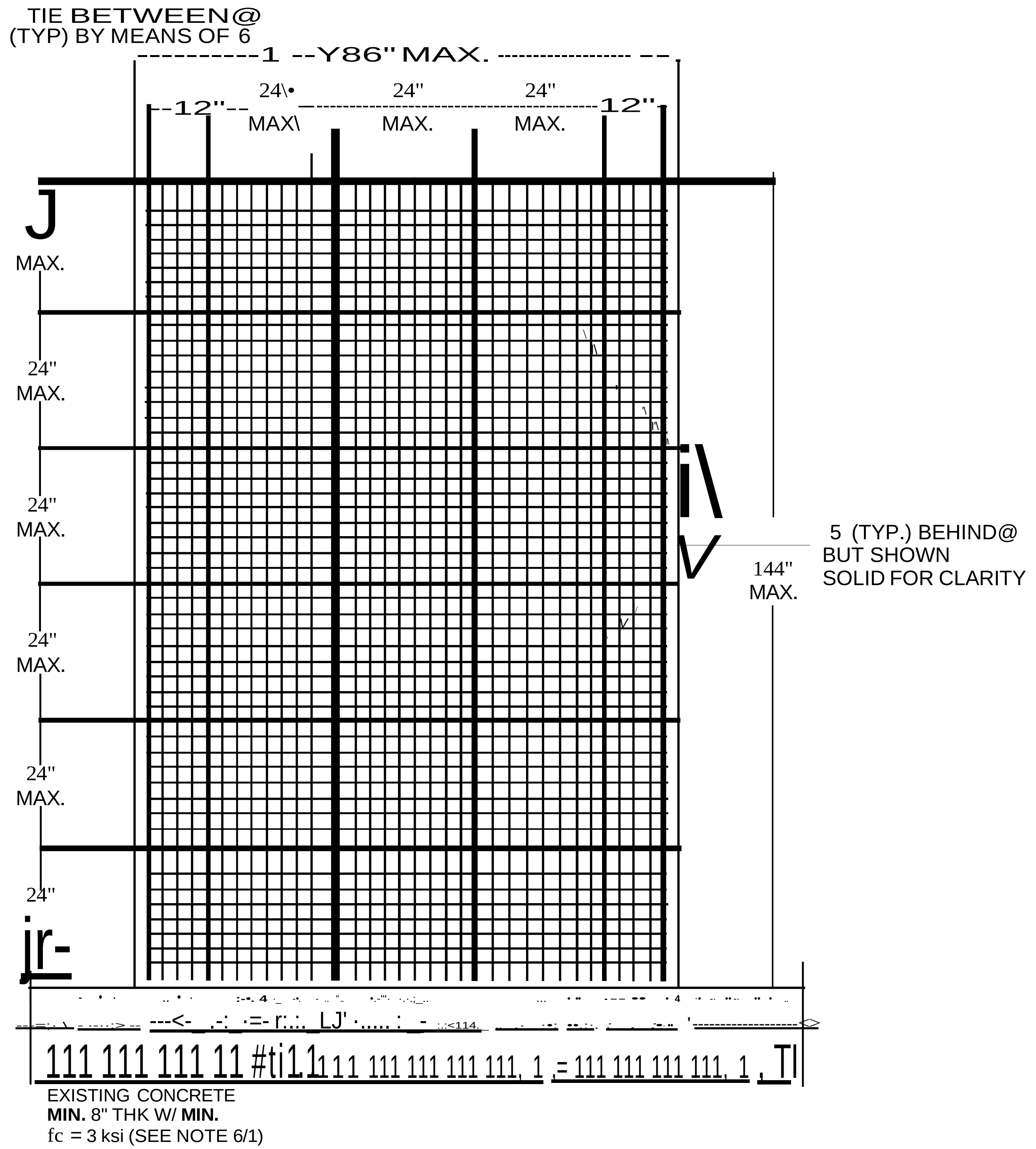
W.H.
DRAWN BY:

07/26/2023
DATE

23-141
DRAWING No

REV. No. DESCRIPTION Dt. REV. No. DESCRIPTION Dt.
07/21/23 5

SHEET 6 of 16



TYPICAL SINGLE SOLID PANEL ELEVATION
W/ (6) LA):OLJT,.,..OVER (5) {EXTERIOR)

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY
163$5 N.W. 36th. St., Ste. 30$- VIRGINIA GARDENS. n. 331661
Phone : (305)871-1$30• f"ax : (30$)871-1$31
•-moll: tlHecoOaol.com
CA-0006719
WALTER A. TILLJT Jr., P.E.
FLORIDA Uc. # 44t67

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.

7978 SW JACK JAMES DR.
STUART, fLORIDA 34997
PH: (954) 205-9577

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
	0ID 20-218	07/21/23			

W.H.
DRAWN BY:

07/26/2023
DATE

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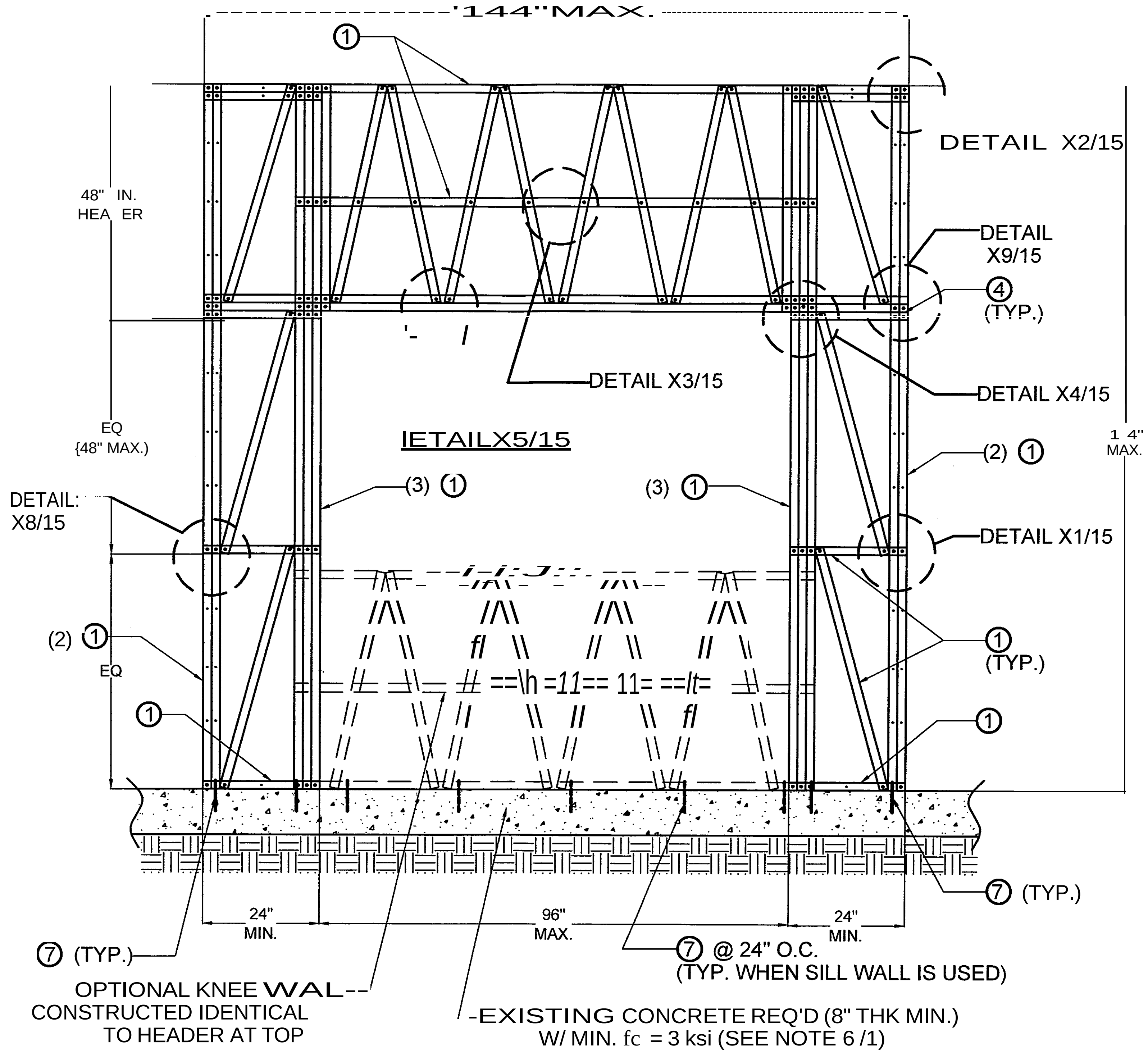
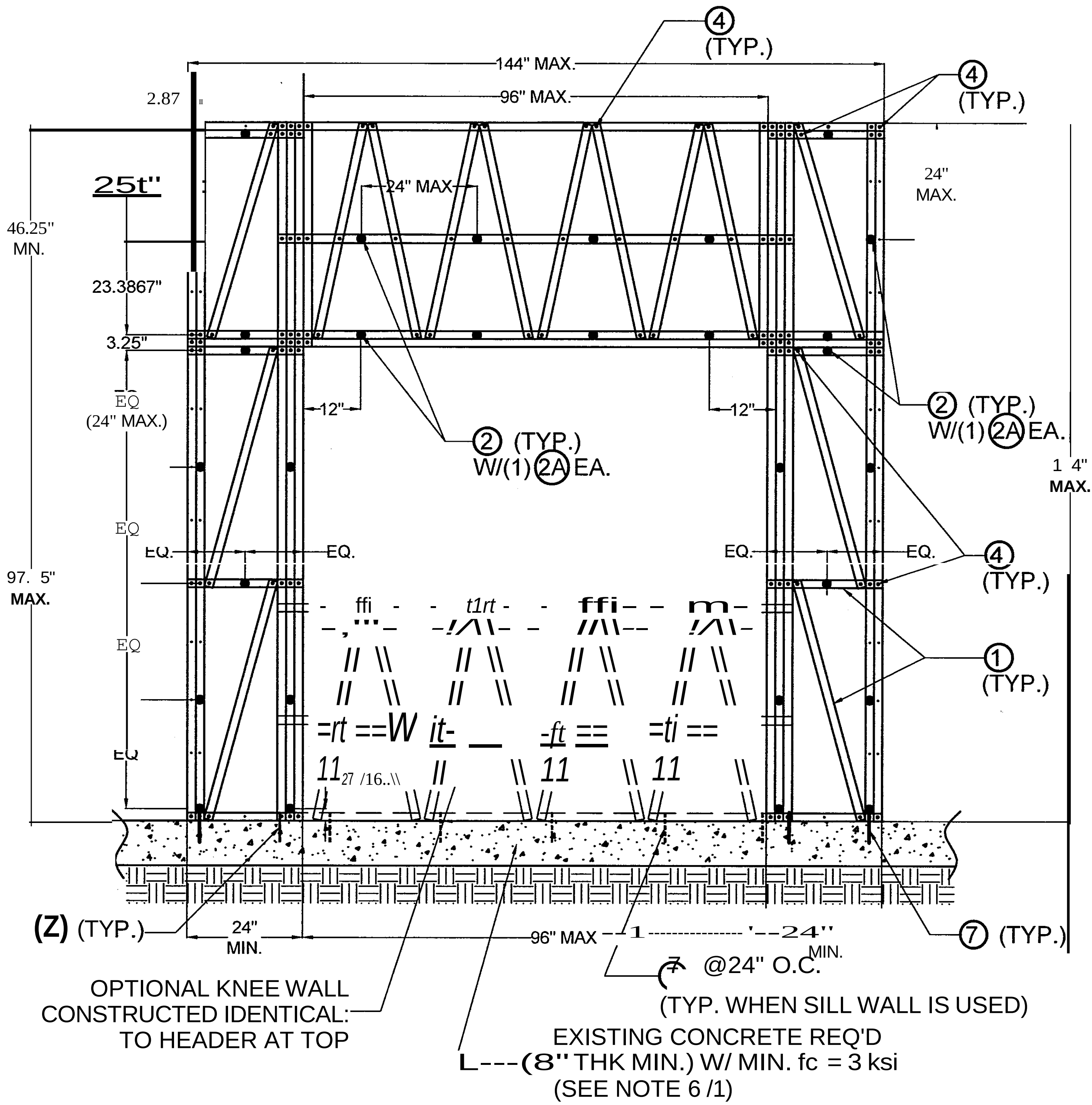


TYPICAL ELEVATION FOR SINGLE PANEL W/ OPENING W/ ①

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

MIAMI DADE COUNTY	P.E. SEAL/SIGNATURE/DATE	©2023 TILTEco. INc. TILLIT TESTING Be ENGINEERING COMPANY 355 N.W. 36th. St. Ste 305 VIRGINIA GARDENS, FL 33166 Phone : (305)871-1530 Fax : (305)871-1531 e-mail: tlltecoOaol.com CA-0006719 WALTER A. TIWT Jr., P.E. FLORIDA Uc. # 44167	STAND UP WALL SYSTEM / NET ZERO BUILDING SYSTEMS, INC. 7978 SW JACK JAMES DR. STUART, FLORIDA 34997 PH: (954) 205-9577

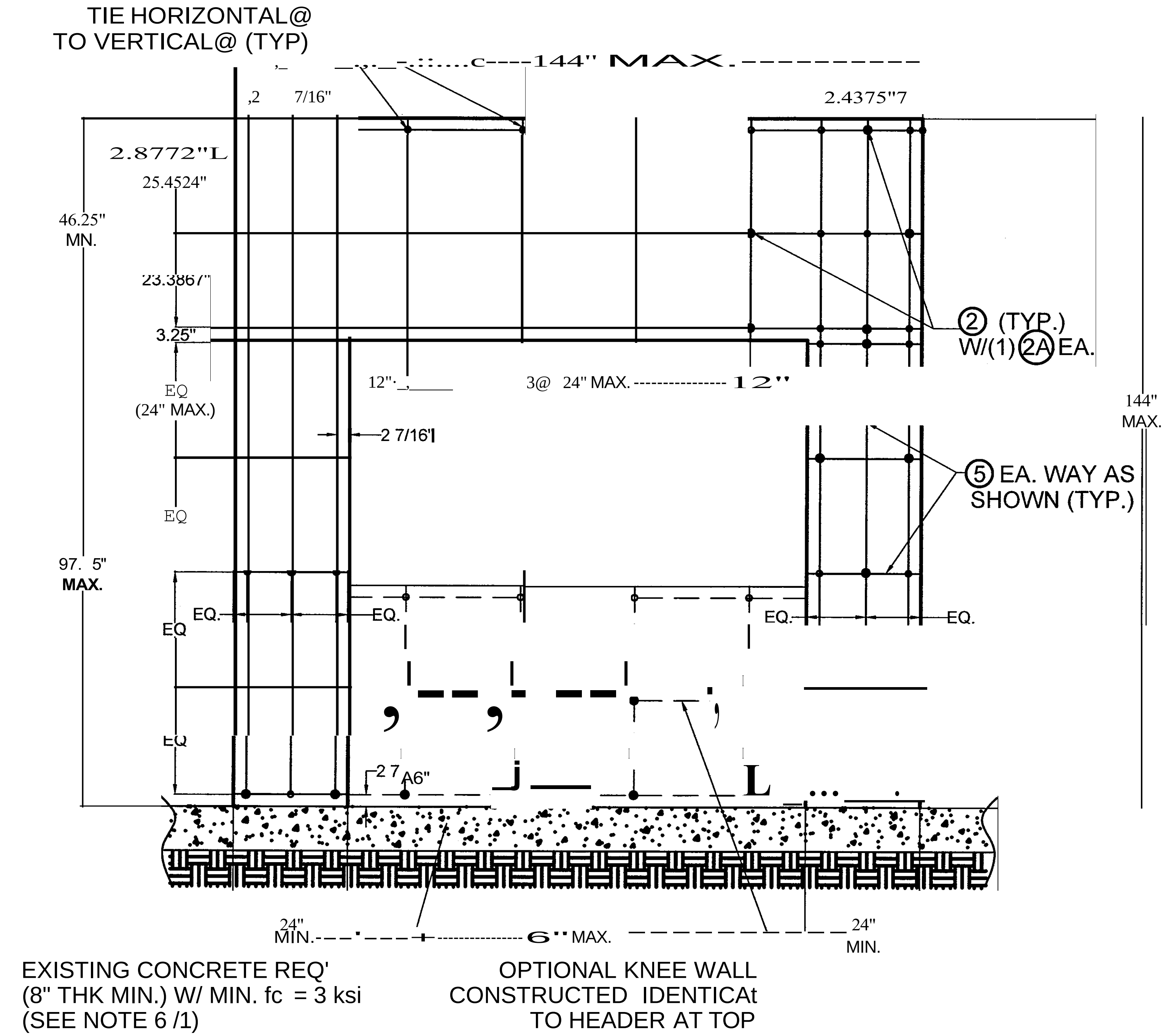
DRAWN BY:	W.H.
DATE	07/26/2023
DRAWING No	23-141
SHEET	8 of 16



TYPICAL ELEVATION FOR SINGLE PANEL

W/ OPENING W/(jJ& LAYOUT OVER(D(EXTERIOR)

N.T.S.



TYPICAL ELEVATION FOR SINGLE PANEL

W/OPENING W/@LAYOUT OVER@&@&@ (EXTERIOR)

N.T.S.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.

TILUT TESTING & ENGINEERING COMPANY
355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, Fl. 33166
Phone: (305)871-1530, fax: (305)871-1531
-mail: HttecoOaol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Uc. # 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.

7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

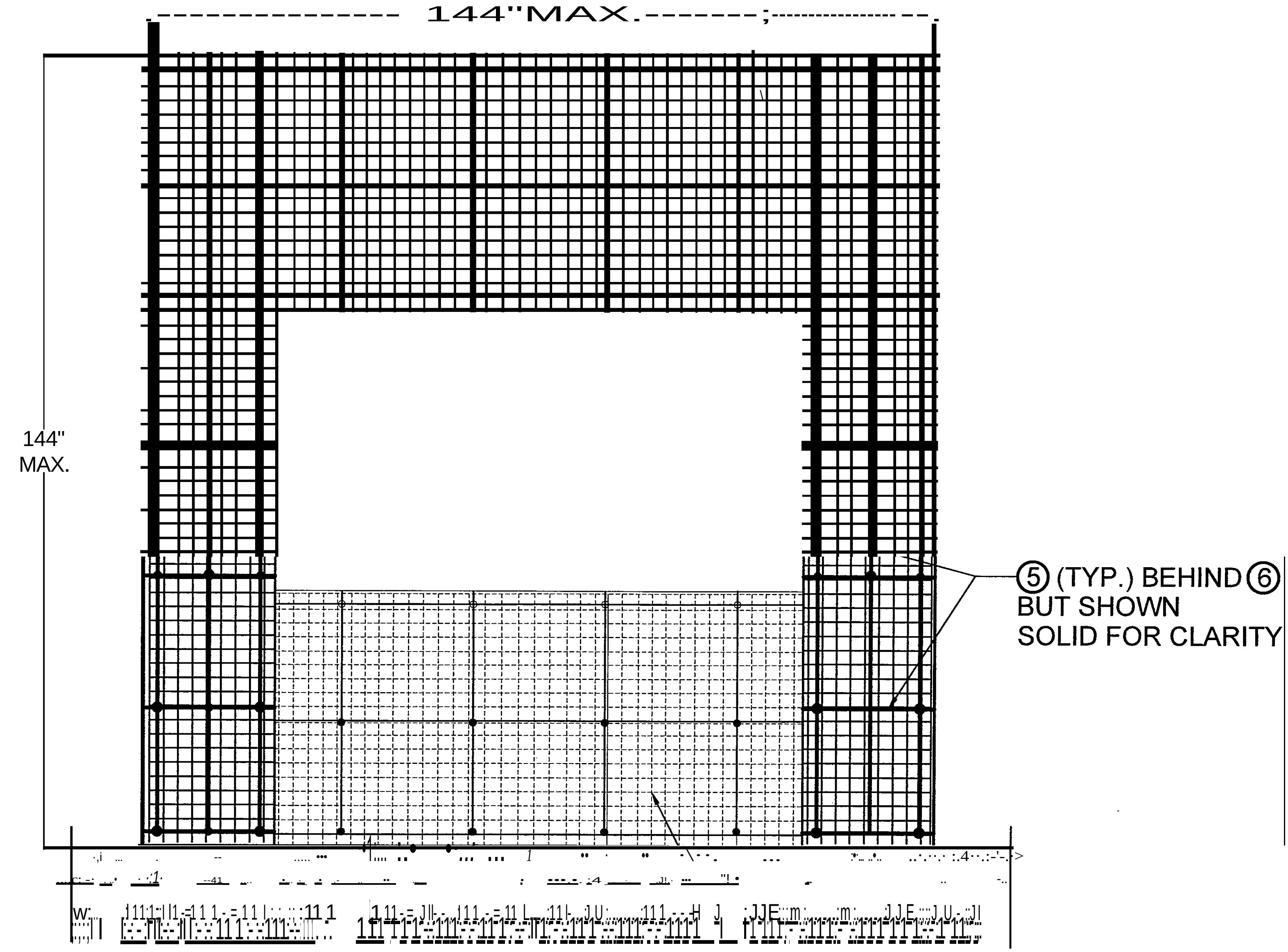
REV. No.	DESCRIPTION	DATE	REV. No.	DESCRIPTION	DATE
	01.D 20-268	07/21/23	5		

W.H. DRAWN BY:

07/26/2023 DATE

23-141 DRAWING No

SHEET 9 OF 16



EXISTING CONCRETE
REQ'D (8" THK MIN.) W/
MIN. fc = 3 ksi (SEE NOTE 611)

OPTIONAL KNEE WALL
CONSTRUCTED IDENTICAL
TO HEADER AT TOP

TYPICAL ELEVATION FOR SINGLE PANEL W/ OPENING W.kifil','t AtOUT OVER (5) (EXTERIOR)

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

No. 44167
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305 – VIRGINIA GARDENS, Fl. 33166
Phone : (305)871-1530 . Fax : (305)871-1531
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WALTER A. TIWT Jr., P.E.
FLORIDA Uc. # 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

REV. No	DESc:RIP1KIII	DATE	REV. No	DESCa1l'1l0N	DATE
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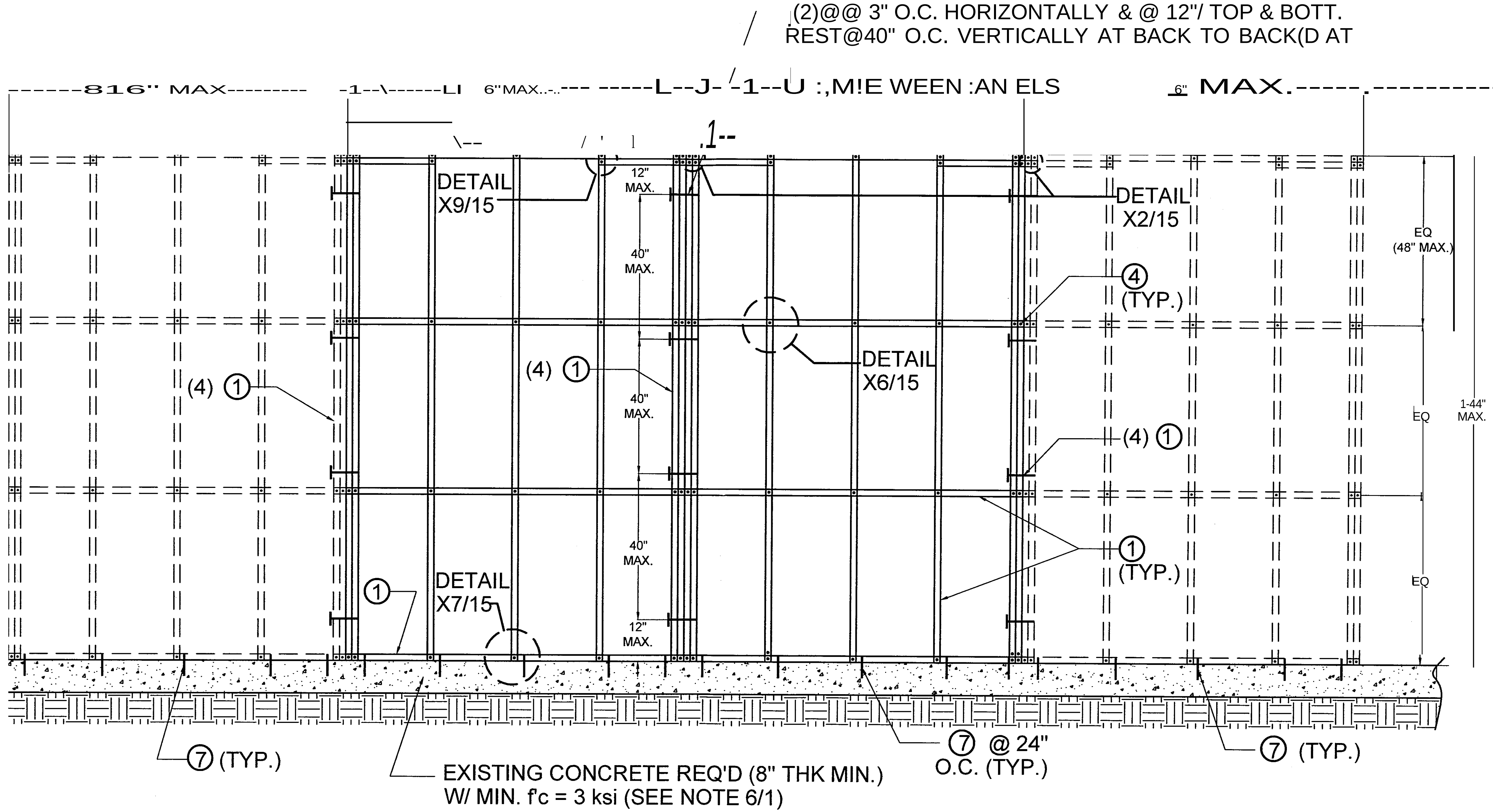
07/26/2023
DATE

23-141
DRAWING No

SHEET 10 OF 16



TYPICAL MULTIPLE SOLID PANELS FRAMING ELEVATION W/ 1

N.T.S.

FLORIDA BUILDING CODE (High Velocfty Hurricane Zone)

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

i hLIEc o INC.

TILLIT TESTING Be ENGINEERING COMPANY
355 N.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, n. 33166
Phone : (305)871-1• rox: (305)871-1531
-mall: HltecoOaol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
fLORIDA Uc. # 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, fLORIDA 34997
PH: (954) 205-9577

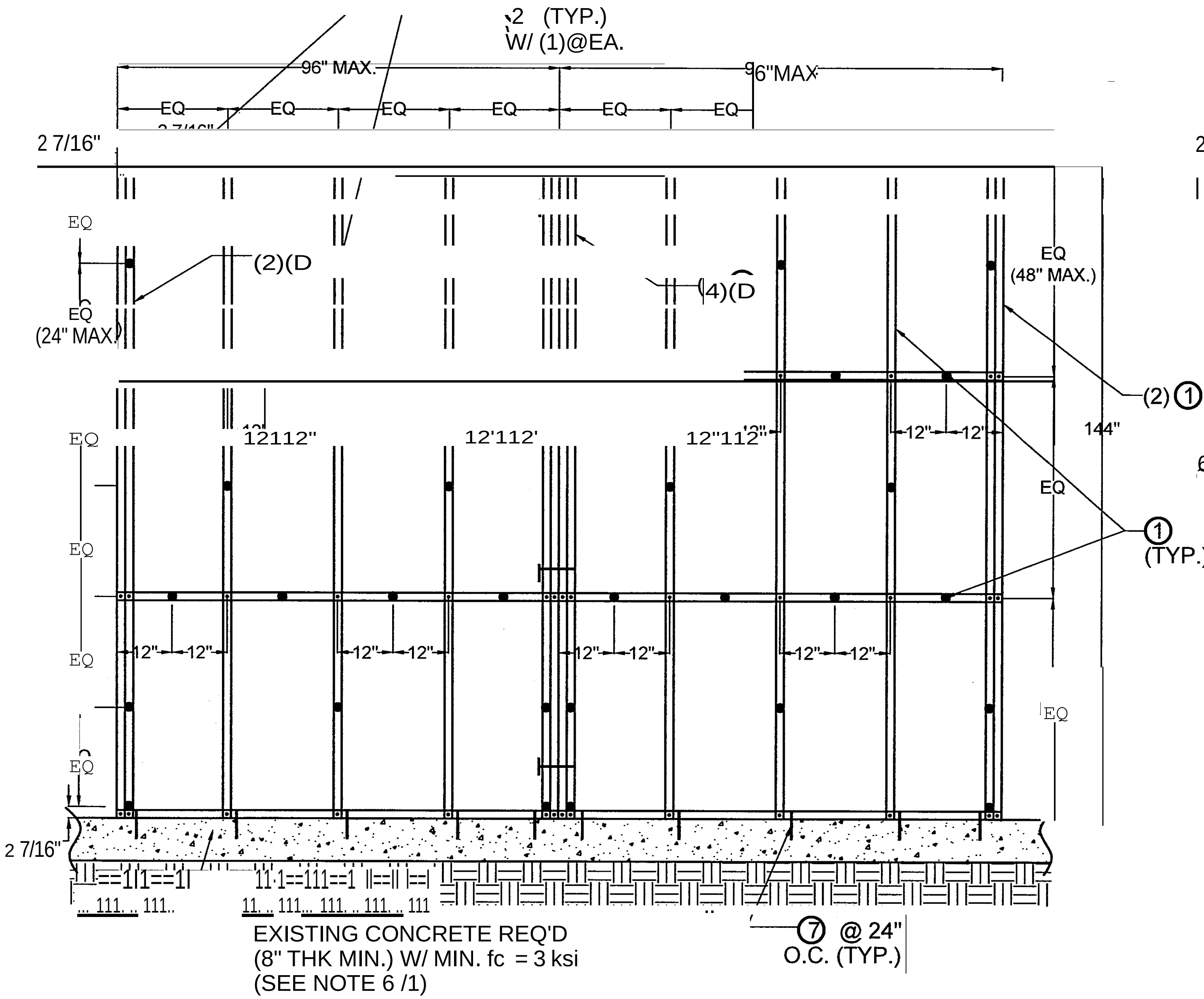
REVN.	DESCRIPTION	DATE	REVN.	DESCRIPTION	DATE
	OLD 20-211	07/21/23			

W.H.
DRAWN BY:

07/26/2023
DATE

23-141
DRAWING No

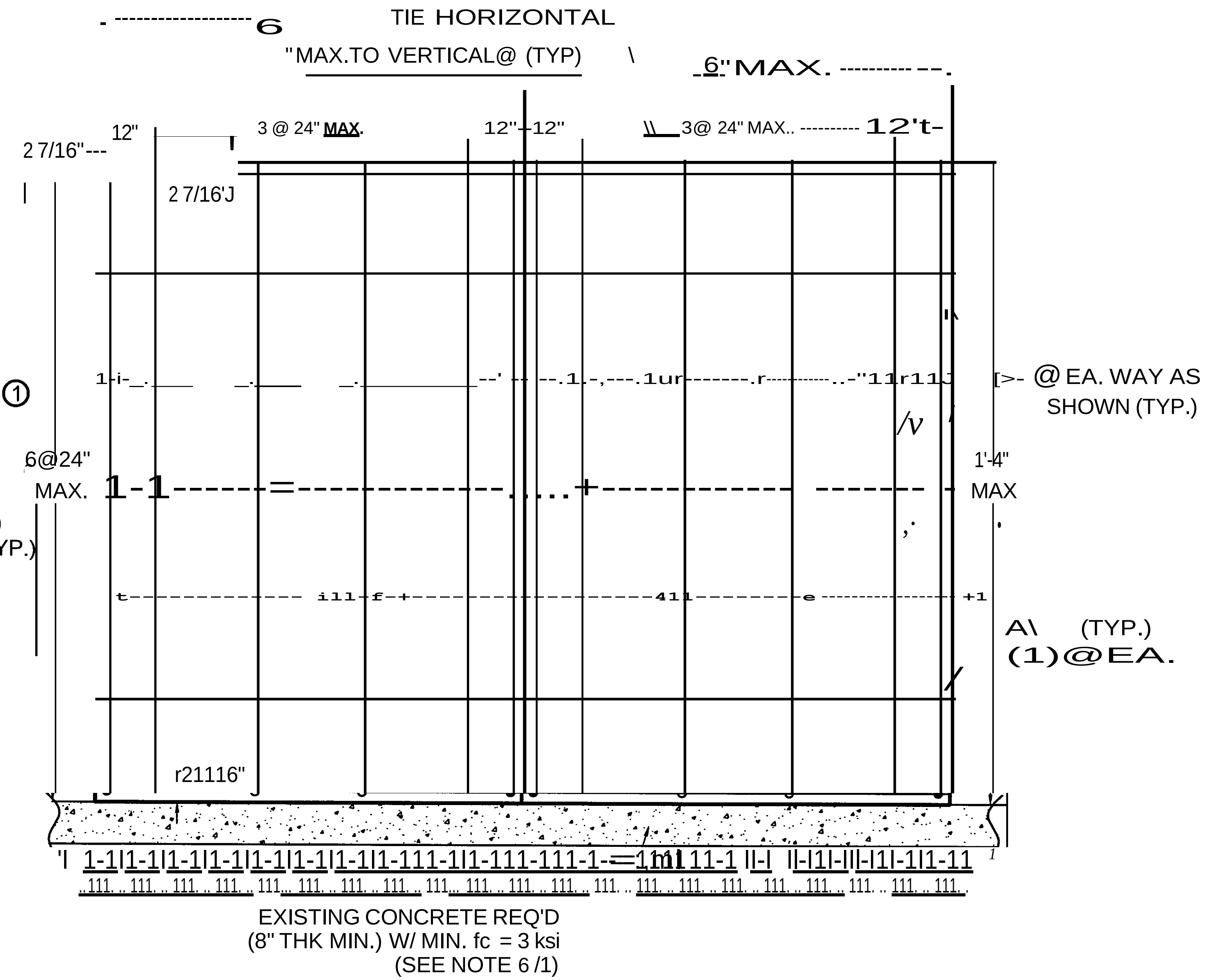
SHEET 14 of 16



TYPICAL MULTIPLE SOLID PANEL ELEVATION
W/ (2) &: @ LAYOUT OVER ffi (EXTERIOR)

N.T.S.

(SHOWN FOR DOUBLE PANELS, MULTIPLE **PANELS SIMILAR)**



TYPICAL MULTIPLE SOLID PANEL ELEVATION
W/ @) LAYOUT OVER f ®& @ {EXTERIOR)

(SHOWN FOR DOUBLE PANELS, MULTIPLE PANELS SIMILAR)

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY
355 N.W. 36th, St., Ste. 305- VIRGINIA GARDENS, Fl. 33166
Phone : (305)871-1530 . Fox : (305)871-1531
e-mail: llttecoOaal.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Uc. 44167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.

7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

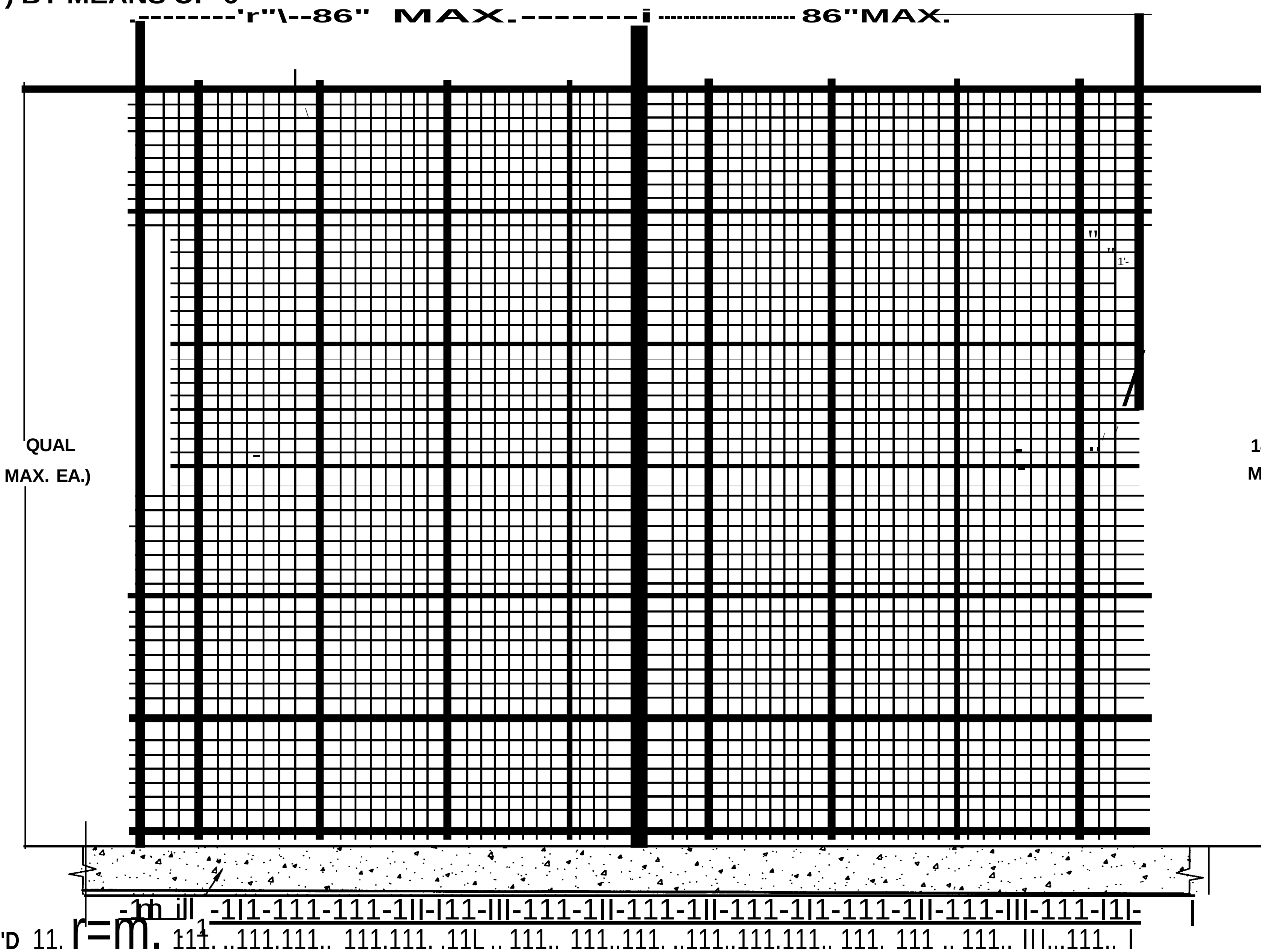
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
	20-28	07/21/23	S		

W.H. DRAWN BY:

07/26/2023 DATE

23-141 DRAWING No

SHEET 10/26



EXISTING CONCRETE REQ'D
(8" THK MIN.) W/ MIN. fc = 3 ksi
(SEE NOTE 6 /1)

TYPICAL MULTIPLE SOLID PANEL ELEVATION
W/ (6) LAYOUT OVER (5) {EXTERIOR)

N.T.S.

(SHOWN FOR DO ri i,,, ,ULTIPLE PANELS SIMILAR)

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

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TILTECO INC.

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e-mail: tilteco@aol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Uc. # 4-4167

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (95-4} 205-9577

REV. No	DESCRtPTIOII	1)4T[	REV, No	DESCIIIPTIOII	1)4T[
1	OLD 20-261	07/21/23	5	-	-
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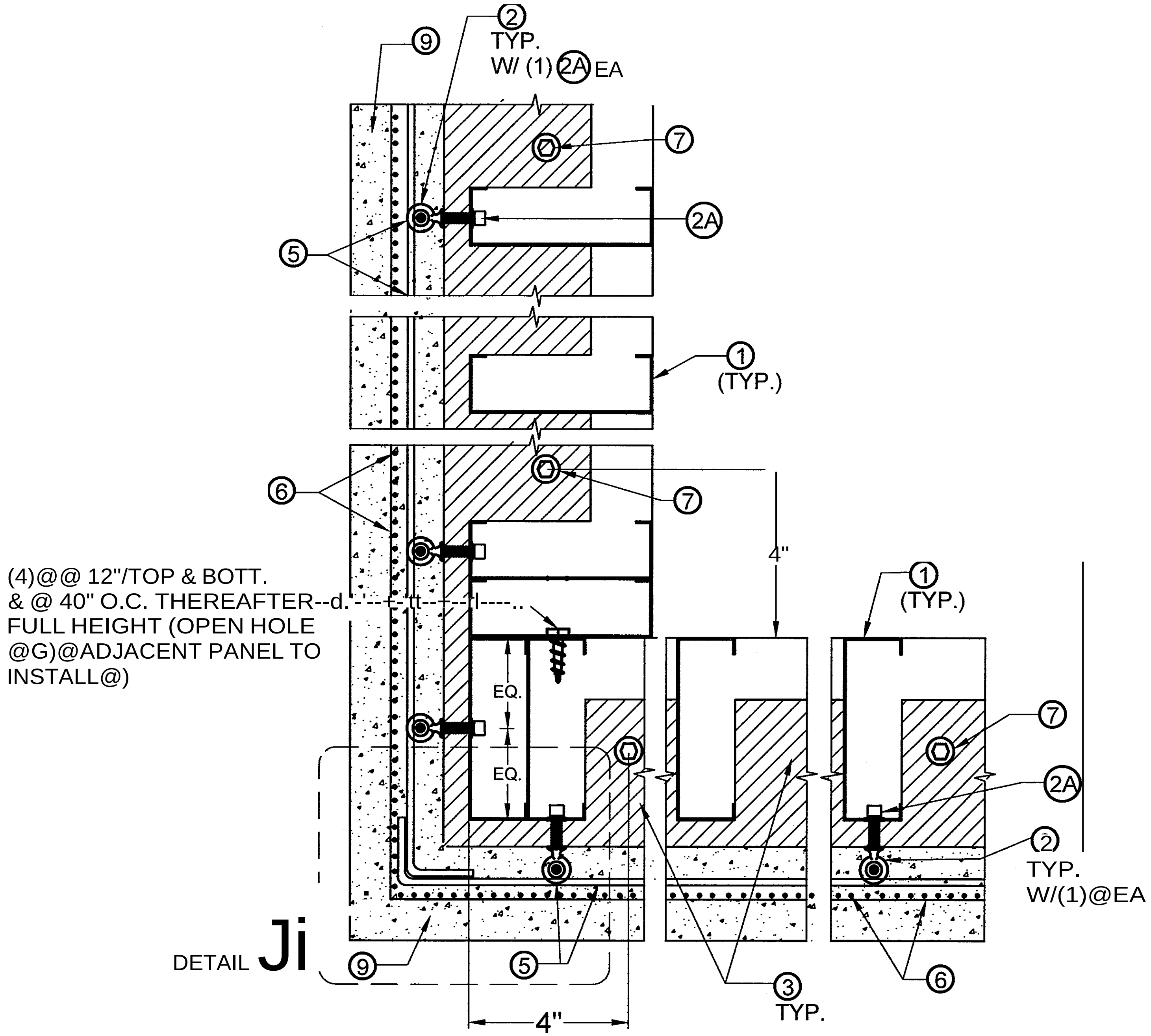
DRAWN BY:

07/26/2023
DATE

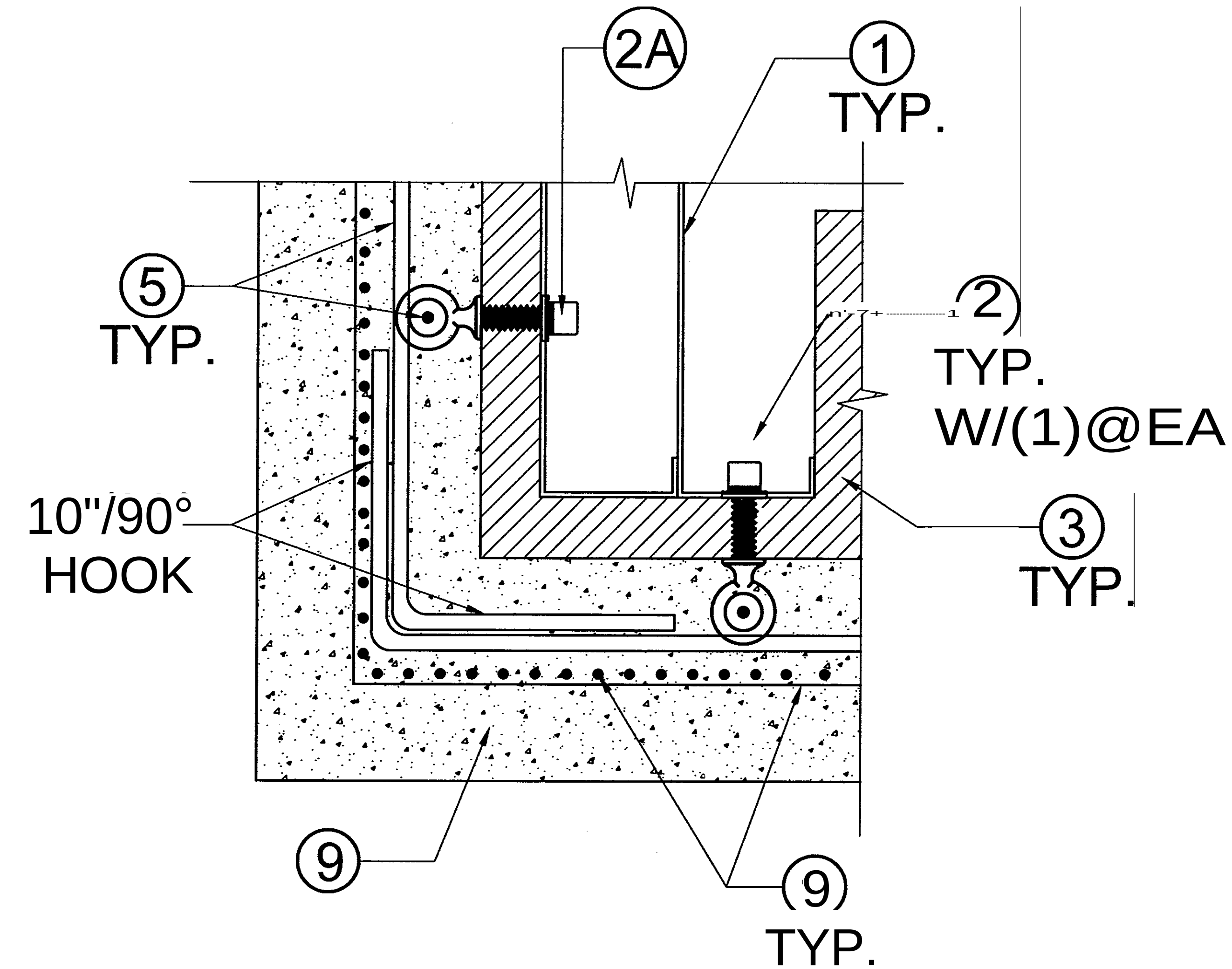
23-141
DRAWING No

SHEET 13 or 16



TYPICAL CORNER DETAIL (PLAN)

N.T.S.



DETAIL "D" {PLAN)

N.T.S.

FLORIDA BUILDING CODE (High Velocfty Hurricane Zone)

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

hLIEc o INC.

TILLIT TESTING & ENGINEERING COMPANY
355 N.W. 36th. St., Ste. 305- VIRGINIA GARDENS, n. 331661
Phone : (305)871-1530 • rox : (305)871-1531
e-mall: tlllecoOaal.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Uc. # -44167

STAND UP WALL SYSTEM

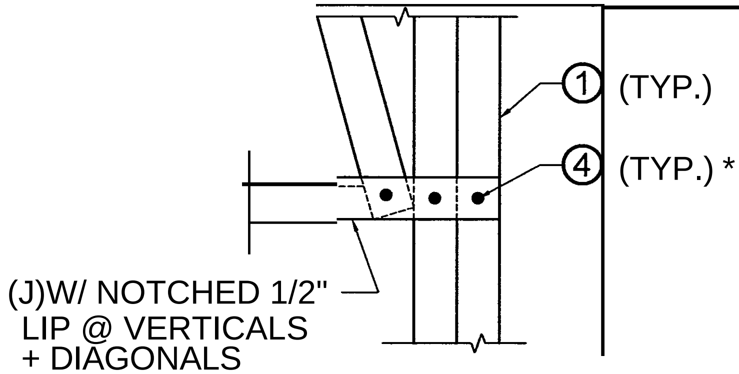
NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

REV. No	DESCIIIPTIOII	DATE	REV. No	DESCRIPTIOM	DATE
	OLD 20-218	07/28/			

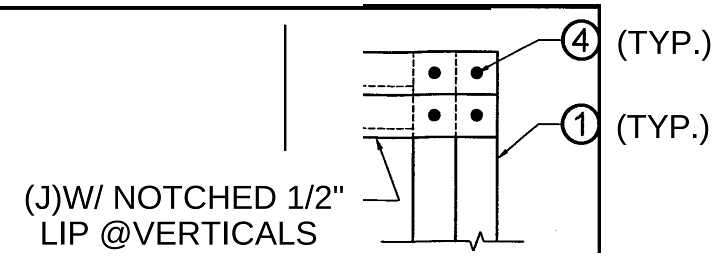
W.H.
DRAWN BY:

07/26/2023
DATE

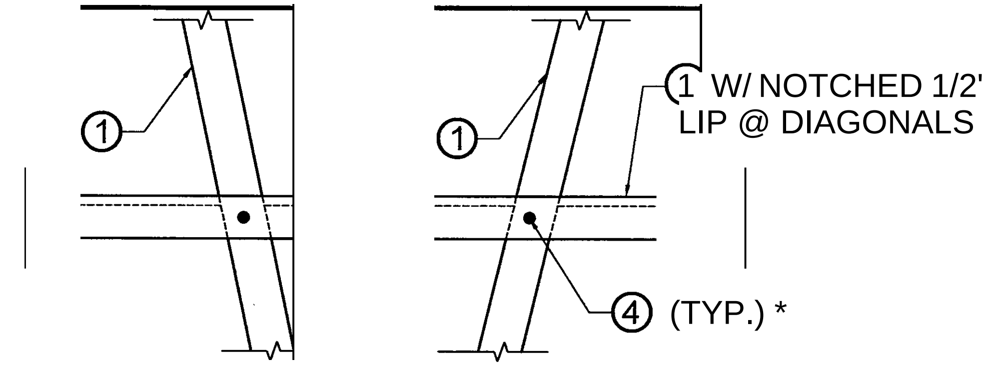
23-141
DRAWING No



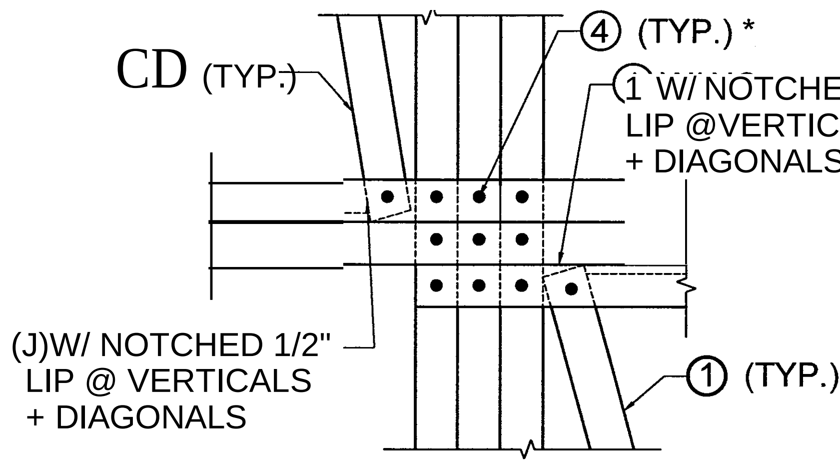
DETAIL X1
N.T.S



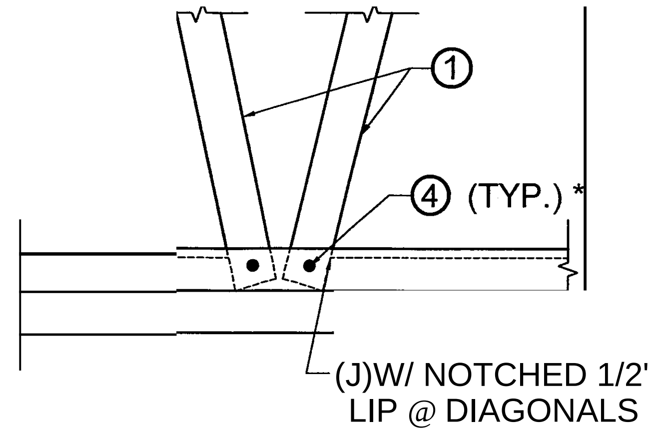
DETAIL X2
N.T.S



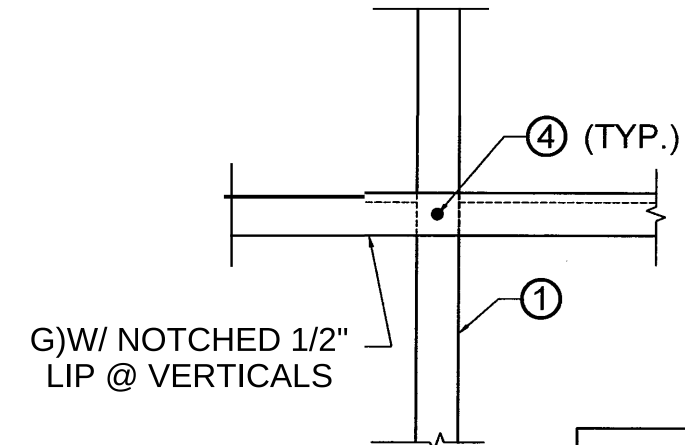
DETAIL X3
N.T.S



DETAIL X4
N.T.S

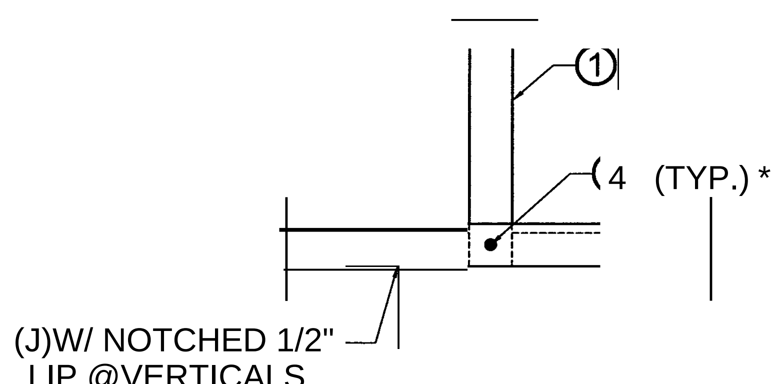


DETAIL XS
N.T.S

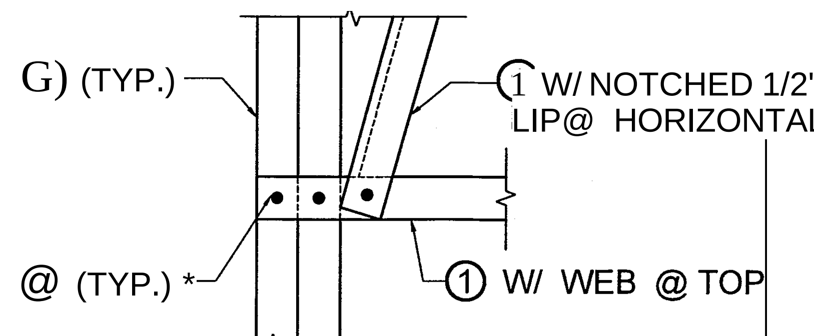


DETAIL X6
N.T.s

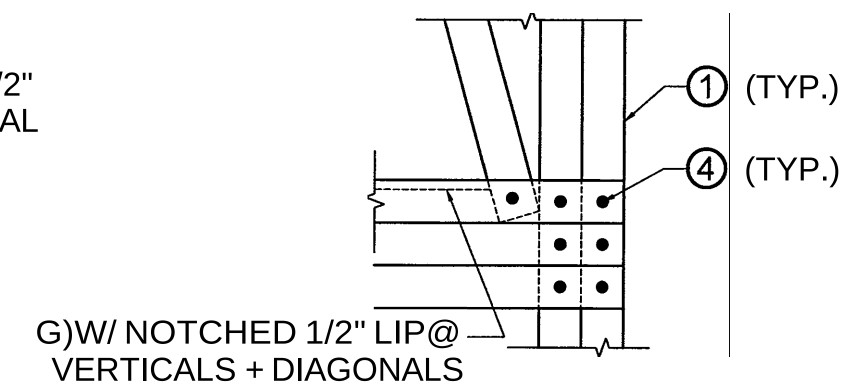
* SCREW REQUIRED
FRONT & BACK OF CD



DETAIL X7
N.T.S



DETAIL X8
N.T.S



DETAIL X9
N.T.S

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

MIAMI DADE COUNTY

P.E. SEAL/SIGNATURE/DATE

hLIEc o INC.
TILLIT TESTING & ENGINEERING COMPANY
355 H.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, Fl. 33166
Phone: (305)871-1"°. fax: (305)871-1531
e-mail: ttllecoOaol.com
CA-0006719
WALTER A. TIWT Jr., P.E.
FLORIDA Lie. # 44167

STAND UP WALL SYSTEM

W.H.
DRAWN BY:

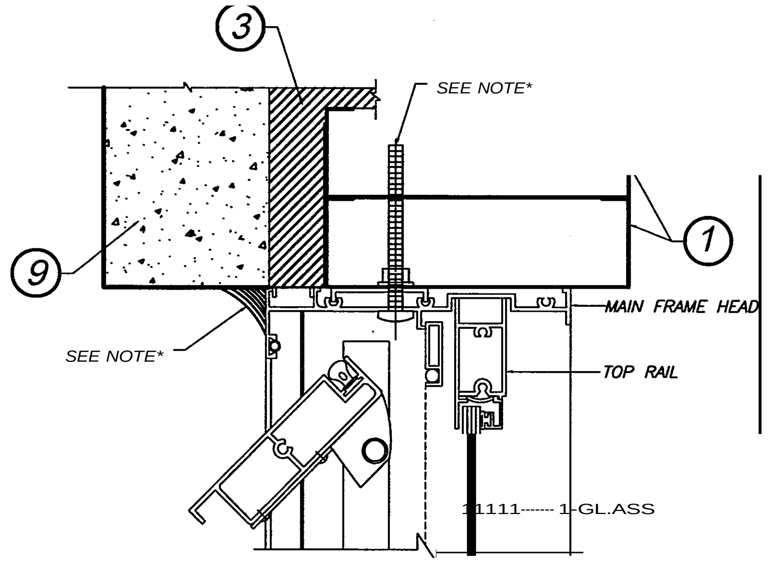
NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART, FLORIDA 34997
PH: (954) 205-9577

07/26/2023
DATE

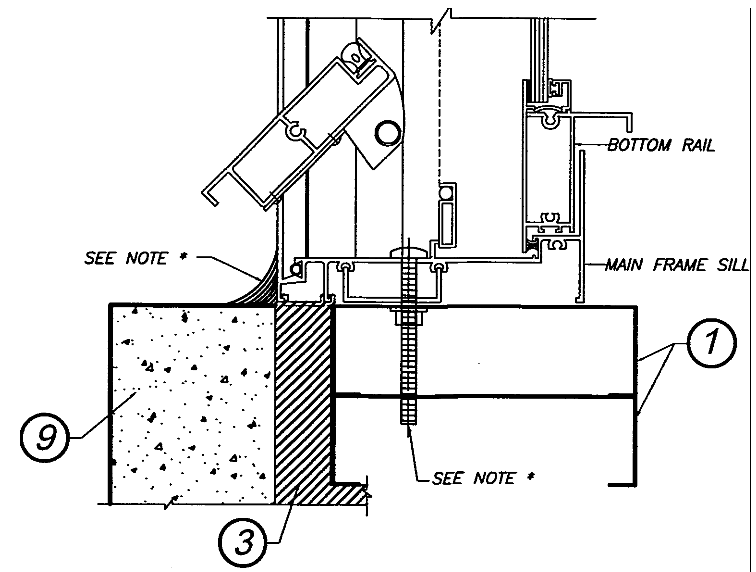
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
	OLD 20-218	07/21/23	5		

23-141
DRAWING No

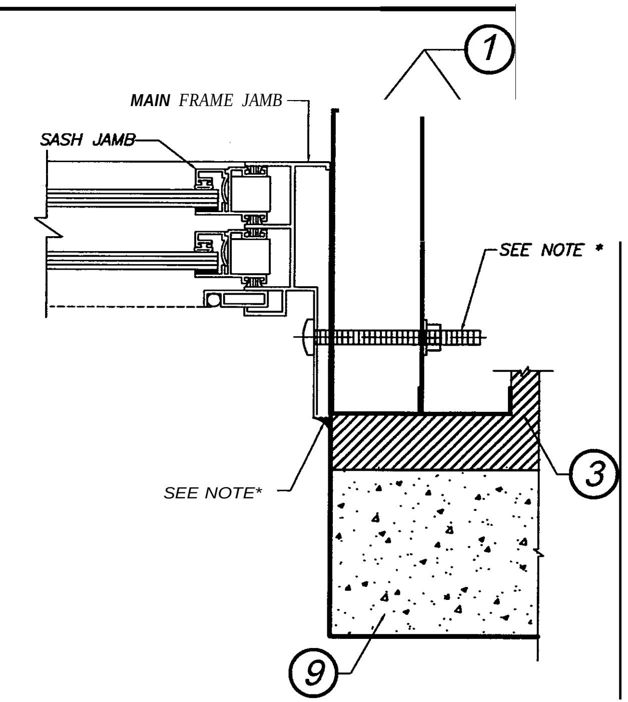
SHEET 15 OF 16



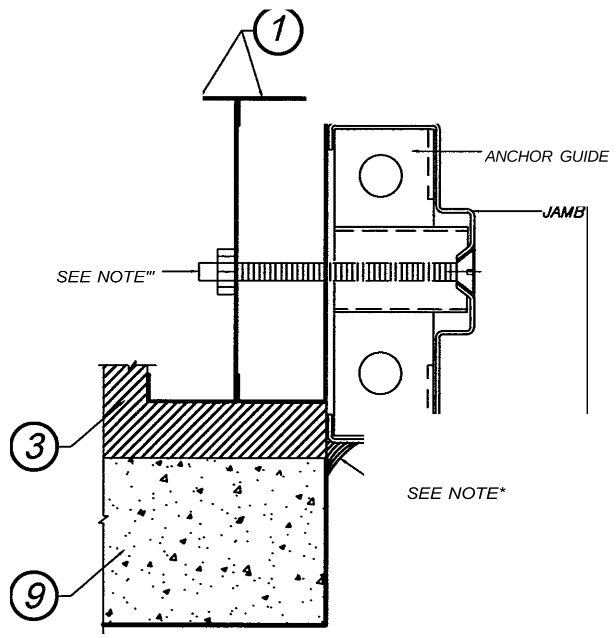
WINDOW HEAD CONNECTION TO PANEL
SCALE : J/8" ;: 1"



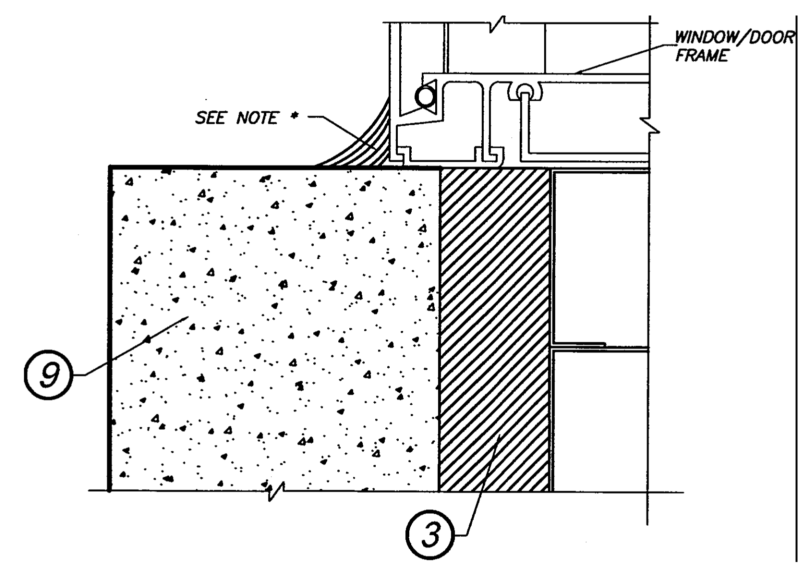
WINDOW SILL CONNECTION TO PANEL
SCALE: J/8" ;: 1"



WINDOW JAMB CONNECTION TO PANEL
SCALE: J/8";: 1"



DOOR JAMB CONNECTION TO PANEL
SCALE: J/8" = f'



TYPICAL SEALING DETAIL
N.T.S.

* SEAUNG DETAIL & SEALANT TYPE & CONNECTION TYPE SHALL STRICTLY COMPLY **W/** SEPARATE NOA FOR WINDOWS OR DOOR TO BE INSTALLED.

TYPICAL DOOR & WINDOW CONNECTION TO WALL PANEL

MIAMI DADE COUNTY

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER

7/26/2023

P.E. SEAL/SIGNATURE/DATE

TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY
355 N.W. 36th. St. Ste. 305 - VIRGINIA GARDENS, FL 33166
Phone : (305)871-1530 . FAX : (305)871-1531
e-mail: tilteco@aol.com
CA-0006719
WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Veloclty Hurricane Zone)

STAND UP WALL SYSTEM

NET ZERO BUILDING SYSTEMS, INC.
7978 SW JACK JAMES DR.
STUART. FLORIDA 34997
PH: (954) 205-9577

DRAWN BY:	W.H.
DATE	07/26/2023
DRAWING No	23-141
SHEET	16 Of 16

REV. No. DESCRIPTION DATE REV. No. DESCRIPTION DATE
OLD 20-258 07/U/23

CURRICULUM VITAE

ERIC FRANK TRILLAS, P.E., S.I., LEED GREEN ASSOCIATE

7850 NW 146th Street – Suite 506, Miami Lakes, FL 33015
Ph: (786) 542-5474
Email: eric@trillasengineering.com

INTRODUCTION

Eric F. Trillas is a Multi-State Board Certified Professional Engineer, Special Inspector and LEED Green Associate within Florida. He has been providing engineering consulting and inspection services for over 15 years. His experience has included performing the duties of structural design engineer, MEP design engineer, project manager, threshold inspector, forensic inspector, and engineering technician.

Mr. Trillas has built up a very strong technical expertise in structural/MEP design and inspections of low to high rise residential and commercial buildings during his 10+ years of experience in the building design and construction industry. Some of the projects Mr. Trillas has been a part of include: All Aboard Florida Miami Central Station (Miami, FL), Grove at Grand Bay (Coconut Grove, FL), One Thousand Museum (Miami, FL), Glass 120 Ocean (Miami Beach, FL), and Hermas Development (Doha, Qatar). His involvement of such projects has included the analyses of lateral force resisting systems, vertical load resisting systems, foundation design, threshold inspections, building inspections and construction material testing.

Mr. Trillas' profound structural design background of low to high rise projects, over 10 years of performing structural forensic studies, and hands-on experience of threshold inspections and materials testing, allows him to provide unparalleled value and knowledge to the design of structural and MEP engineering projects and forensic studies of structures to his clients across the nation.

EDUCATION

Bachelor of Science - Civil Engineering **2009**
FL Institute of Technology
Melbourne, FL

Master of Science - Structural Engineering **2014**
FL International University
Miami, FL

PROFESSIONAL

	State	License No.	Date of Licensure
1.	Alabama	PE No. 39024-E	January 2020
2.	Arizona	PE No. 72745	January 2021
3.	Colorado	PE No. 0056666	November 2019
4.	Connecticut	PE No. 33053	January 2021
5.	Delaware	PE No. 26113	February 2021
6.	Washington DC	PE No. 923279	March 2021
7.	Florida	PE No. 77860	July 2014
8.	Georgia	PE No. 046725	January 2021
9.	Illinois	PE No. 062.072893	February 2021
10.	Kansas	PE No. 28112	January 2021
11.	Kentucky	PE No. 36245	January 2021
12.	Louisiana	PE No. 44303	February 2020

	State	License No.	Date of Licensure
13.	Maryland	PE No. 55314	December 2019
14.	Massachusetts	PE No. 56196	February 2021
15.	Mississippi	PE No. 30820	February 2020
16.	New York	PE No. 104129	February 2021
17.	North Carolina	PE No. 049744	December 2019
18.	Ohio	PE No. PE.86988	August 2021
19.	Pennsylvania	PE No. 091826	January 2021
20.	Rhode Island	PE No. 13805	February 2021
21.	South Carolina	PE No. 38636	January 2021
22.	Tennessee	PE No. 123545	May 2020
23.	Texas	PE No. 137097	January 2020
24.	Virginia	PE No. 063215	July 2021

WORK EXPERIENCE

TRILLAS CONSULTING ENGINEERS, LLC **August 2015 – Present**
Miami, FL

PRESIDENT
As founder and President, responsible for all engineering activities. General responsibilities include overseeing client contacts, proposals, engineering analyses, establishing engineering policies and practices, scheduling daily and long-term jobs and providing engineering input to the design procedures. In addition, Mr. Trillas oversees all structural and building envelope forensic inspections. General responsibilities include establishing scopes of forensic evaluations, coordinating client work products, reviewing technical findings, preparing conclusions and recommendations, providing expert engineering consultation and testimony. Areas of technical consultation include, but are not limited to, structural, construction materials, building construction, building envelope and ordinance or law studies.

GFA INTERNATIONAL, INC. **January 2016 – May 2020**
Miami, FL

BRANCH MANAGER
As GFA's Miami Branch Manager, Eric is responsible for overseeing and managing the day-to-day operations, including working closely with GFA team members, clients, project managers, superintendents, architects, and engineers to ensure the timely delivery of quality services. In addition, Mr. Trillas oversaw all structural forensic inspections.

GFA INTERNATIONAL, INC. **February 2015 – January 2016**
Delray Beach, FL

INSPECTIONS DEPARTMENT MANAGER
As Inspections Department Manager, responsible for all inspection activities in the Delray Beach and Miami offices. General responsibilities include overseeing a staff of 10 individuals, client contacts, working together with the estimating team on proposals, establishing inspection policies and practices, scheduling daily and long-term jobs and providing engineering input to all inspection services.

DESIMONE CONSULTING ENGINEERS **August 2013 – February 2015**
Miami, FL

PROJECT ENGINEER
As Project Engineer, responsible for the structural design and inspections of low to high rise residential and commercial buildings. General responsibilities included structural engineering analysis and designs, project management, forensic inspections, maintaining good working relationships with architects and contractors

ENGINEERING EXPRESS **May 2011 – August 2013**
Deerfield Beach, FL

LEAD PROJECT MANAGER
Managed numerous responsibilities, such as structural engineering designs, product approval website development, forensic inspections, and business development functions. Worked closely with the Lead Professional Engineer in several structural design projects which encompass departments such as Building Envelope, Glass and Glazing, Safeguards, Product Approval Evaluation, and Specialty Aluminum Structures. Assisted in the growth and development of the online product approval search website ApprovalZOOM.com.

P R O J E C T   E X P E R I E N C E

Mr. Trillas experience has included performing the duties of building/threshold inspector, construction material testing engineer, building forensic study engineer, storm damage evaluation engineer, structural/MEP design engineer, project manager, and engineering technician. As a licensed Special Inspector under F.S. 553, Mr. Trillas has provided inspections and qualification of numerous special/threshold buildings.

Representative **Design and Inspection** experience

All Aboard Florida (Brightline) – Miami Central Station – Miami, FL
Project Description: Southernmost stop for the express passenger rail service running from Orlando to Miami. Parkline Living consists of a North and South Tower that offers over 930,000 square feet of residential space and sits on top of a three-story parking structure above the MiamiCentral Station. Amenities include a full outdoor living experience, featuring two fenced-in dog parks, a running track, a cross-fit lawn, grill stations, resort and lap pools, cabanas, a movie wall, and lounge areas. 2 MiamiCentral sits 10 stories above the Brightline transportation platform and parking levels, and offers modern and sustainable Class A office space with connected access to the MetroMover, MetroRail, MetroBus, Tri-Rail, and Brightline. The MiamiCentral Station features a 59,000 square-foot station facility, 41,000 square-foot loading area, an 180,000 square-foot passenger platform, 178,000 square feet of retail space, and 344,000 square feet of parking with 800 spaces.

Scope: Threshold Inspector, Material Testing, Private Provider (Building Inspector)

Met Square – Miami, FL
Project Description: Met Square is the final phase in the Metropolitan Miami project. This innovative, urban center includes an 80,000 square foot Silverspot Cinema at levels 3 and 4 and 40,000 square feet of luxury retail and dining destinations at the ground and second levels. The project also contains a 34-story tower, Muse by Zom USA, with 188 luxury apartments and a museum paying tribute to the Native American Tequesta tribe and Miami's first hotel, The Royal Palm Hotel built by Henry Flagler.

Scope: Threshold Inspector, Material Testing

Grove at Grand Bay – Coconut Grove, FL
Project Description: Two 20-story residential buildings of reinforced concrete where floor plates rotate as they rise from the second to the 17th level. With floor plates that rotate every three feet at every elevation from the 3rd to the 17th floors, the design creates two gracefully twisting towers that appear to be turning to capture the view as they rise to the sky.

Scope: Structural Design, Threshold Inspector

Paramount Condominium – Fort Lauderdale, FL
Project Description: 18-story beachfront condominium building with 95 units. The front of the building features a porte-cochere that opens to a lavish garden. Paramount Fort Lauderdale also boasts a state-of-the-art fitness center, complete with a beachside pool, massage and steam room, and a play area for the kids. A private deck and cabanas, and summer kitchens al-fresco.

Scope: Threshold Inspector, Material Testing

Overture Dadeland – Miami, FL
Project Description: Overture Dadeland is a 22-story apartment rental community tower for those 55+ in Miami, Florida. The upscale high-rise community offers fitness, wellness, creative, educational and social activities. It also features an outdoor heated pool, a zen-inspired yoga studio, a Skylounge, and wine room. One, two, or three-bedroom homes range in size from 750 to 2,041 square feet.

Scope: Threshold Inspector, Material Testing, Private Provider (Building Inspector)

Overture Dadeland – Miami, FL
Project Description: 62-story residential tower design by Zaha Hadid Architects and sits opposite Museum Park in Miami as tops out at 709 ft. The structure has 82 luxury units, and 260 parking spaces for a total gross area of 911,027 square feet. One Thousand Museum's concrete exoskeleton structures its perimeter in a web of flowing lines that integrates lateral bracing with structural support.

Scope: Structural Design

Glass 120 Ocean – Miami Beach, FL

Project Description: GLASS, located at 120 Ocean Drive in Miami Beach's 'South of Fifth' neighborhood is comprised of only ten full floor residences and situated just steps away from the ocean. Designed by Miami architect Rene Gonzales and featuring landscape designs by Raymond Jungles, GLASS's aesthetic reflects its setting at the intersection between the Atlantic Ocean and the South of Fifth's district's urban grid.

Scope: Structural Design, MEP Design

Faena Art District – Miami Beach, FL

Project Description: This building is volumetrically made up by a cylinder, that accommodates gathering spaces, and a cube, consisting of a hotel and meeting rooms. The distinctive façade of the building is made in concrete structural panels that are drilled with glass elements, responding to both structural needs and the opening views towards the sea front and the city.

Scope: Structural Design

Ocean Cadillac – Miami, FL

Project Description: Project consisted of an existing site with a 60,000-sf building, which was partially demolished and retrofitted to meet the new design needs of the Ocean Cadillac Dealership. New design consists of a 2-story car showroom, a 2-story car service shop, a car wash area, and a 4-story illuminated showroom tower.

Scope: Structural Design

Hermas Development – Doha, Qatar

Project Description: Hermas Business Park is located in the Marina District, Lusail City, a self-contained sustainable and comprehensively planned mixed used development in the State of Qatar. The project features 4 Office buildings around a central courtyard and connected on the 10th floor and roof level. It is composed of 4 basement parking levels, Ground floor for retail areas, 9 Floors of Office spaces and 10th floor level that includes dining area, gym and spa.

Scope: Structural Design