COUNTY OF SUFFOLK

STEVEN BELLONE
SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

GREGSON H. PIGOTT, M.D., M.P.H.
Commissioner

November 1, 2022

Mr. Tamer Osman, P.E.
Delta Specialty Precast Concrete Engineers
860 Hooper Road
Endwell, NY 13760
Sent via e-mail: precast@delta-eas.com

Re: Fuji Clean CEN14 Precast Containment Vault

Dear Mr. Osman,

The Suffolk County Department of Health Services, Division of Environmental Quality, Office of Ecology has received and reviewed your design drawings and computations prepared for Roman Stone Construction Company, Project No. 2022.487.001, with your signature and sealed on 10/20/2022 and 10/31/2022 for the "SCDHS (CEN14) 14'-0" x 7'-0" x 8'-0" ID Precast Containment Vault Designed for HS-20 Vehicle Live Load".

Based on the information provided, the Department of Health Services approves the use of this precast concrete structure as a containment vault for the Fuji Clean model CEN14 Innovative and Alternative Onsite Wastewater Treatment System (I/A OWTS) in traffic areas, with a burial depth of zero (0) to three (3) feet below finished grade and water table below the bottom of the structure.

This approval requires that at least one readily accessible suction line (minimum ¾-inch diameter) be permanently installed within the containment vault extending from a maximum of 3-inches above the vault's bottom to its access riser, a maximum of 1-foot below finished grade. This suction line is required to be present to allow for purging of trapped storm-water with the use of a portable, self-priming pump as part of routine operations and maintenance servicing of the I/A OWTS.

A copy of this letter and the signed and sealed design report will remain on file in the Office of Wastewater Management for future reference.

Public Health
Prevent. Promote. Protect.

DIVISION OF ENVIRONMENTAL QUALITY
Office of Ecology
360 Yaphank Avenue, Suite 2B, Yaphank NY 11980
P:(631) 852-5750 F:(631) 852-5812

If you have any questions, please do not hesitate to contact me at (631) 852-5811.

Sincerely,

Ken Zegel, P.E.
Principal Public Health Engineer
Chief, Office of Ecology

cc: John Sohngen, P.E. (SCDHS)
Scott Samuelson (Fuji Clean USA)
Kevin McGowin (Advanced Wastewater Solutions)
Bryan McGowin (Advanced Wastewater Solutions)
Vincent Ernst (Delta)

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ACCEPTED BY THE SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
(DEPARTMENT) BASED ON INFORMATION PROVIDED BY ENGINEER.

The Department has reviewed this submittal for completeness and is hereby approved for use in Suffolk County. This approval is solely for the model(s), units(s) and/or structure(s) included in the engineering design drawings and calculations provided by the licensed design professional. Any changes or modifications to the approved design must be submitted for review and approval by the Department prior to its use in Suffolk County. The Department is not responsible for any errors, omissions, failures, construction defects or installation errors that may occur due to design professional, manufacturer, distributor or installer oversight or negligence.

11/01/2022
APPROVAL DATE

Ken Zegel, P.E.

Project Number: 2022.487.001

DESIGN COMPUTATIONS FOR

SDCHS (CEN14)
14'-0" x 7'-0" x 8'-0" ID
Precast Containment Vault
Designed for HS-20 Vehicle Live Load

PREPARED FOR:

Roman Stone Construction Company
85 South 4th Street
Bay Shore, New York 11706

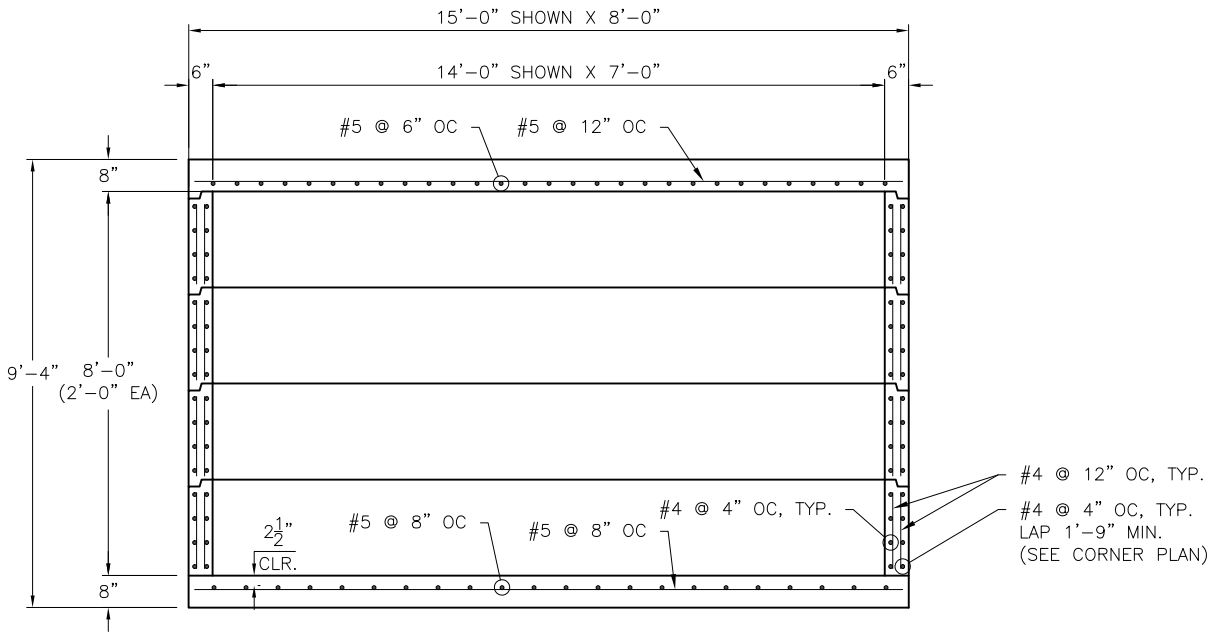
PREPARED BY:

DELTA
SPECIALTY PRECAST CONCRETE ENGINEERS

State License # 111870

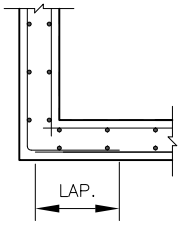
10-31-22

860 Hooper Road, Endwell, New York 13760
TEL: 607-231-6600 FAX: 607-231-6650
EMAIL: precast@delta-eas.com
www.delta-eas.com



ELEVATION

10-31-22



CORNER PLAN

DESIGN NOTES

(TO BE VERIFIED BY EOR)

1. DESIGN PER ACI 318–14 WITH HS–20 LOADING.
2. BAR COVER = 1" U.N.O.
3. EARTH COVER = 0'–0" TO 3'–0"
4. EQUIVALENT FLUID PRESSURE = 39.6 PCF
5. f'c @ 28 DAYS = 5,000 PSI
6. WATER TABLE = BELOW BOTTOM OF STRUCTURE.
7. REINFORCEMENT = BAR PER ASTM A615, GRADE 60
8. TRIM OPENINGS WITH DIAGONAL #4 BARS, EXTEND BARS MINIMUM 12" BEYOND OPENINGS, BEND BARS AS REQ'D TO MAINTAIN BAR COVER.
9. PROVIDE ADD'L REINFORCING AT OPENINGS EQUAL TO STEEL INTERRUPTED, HALF EACH SIDE AND IN THE SAME PLANE.

REV.NO.	DATE	REVISION
1 VCE	10/31/22	REVISED BASE REINFORCING

PREPARED BY:

DELTA
SPECIALTY PRECAST CONCRETE ENGINEERS
860 HOOPER ROAD, ENDWELL, NY 13760–1564
TEL: (607) 231–6600 FAX: (607) 231–6650

PREPARED FOR:

ROMAN STONE CONSTRUCTION COMPANY

DATE: 10/14/22	SHEET TITLE: REINFORCING SUMMARY		DRWN BY: CCFH
SCALE: N.T.S.			CKD BY:
PROJECT: SDCHS 14'–0" X 7'–0" X 8'–0" I.D PRECAST VAULT			
CONTRACTOR:			DWG. I.D. RS–01
DELTA PROJ. NO.: 2022.487.001			SHT. NO. 1 OF 1

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JOB:	2022.487.001
DESCRIPTION:	14'-0" x 7'-0" x 8'-0" ID Vault
SHEET NO.:	of
CALCULATED BY:	CCFH Date 10/14/2022
CHECKED BY:	Date

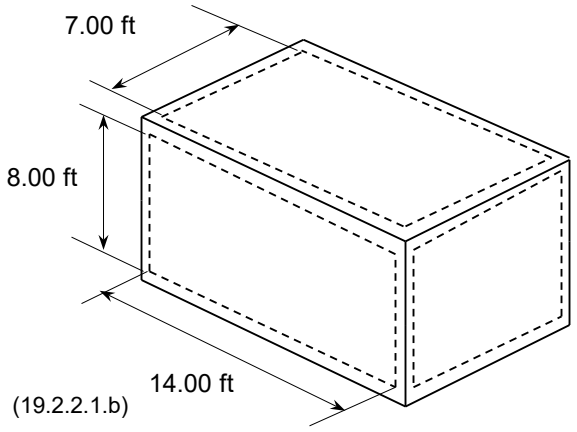
PRECAST VAULT DESIGN
DESCRIPTION

Length (I.D.) =	14.00 ft
Width (I.D.) =	7.00 ft
Height (I.D.) =	8.00 ft
Wall Thickness =	6.00 in
Base Slab Thickness =	8.00 in
Cover Slab Thickness =	8.00 in

Denotes input field

TECHNICAL DATA

Earth Cover (Min.) =	0.00 ft		
Earth Cover (Max) =	3.00 ft		
Min Watertable Depth =	12.33 ft		
ka =	0.33		
Unit Weight of Soil =	120 pcf		
Equivalent Lateral Fluid Pressure =	0.040 kcf		
LL Surcharge =	0.08 ksf		
Depth Below F.G. to Apply Surcharge =	8.00 ft		
Concrete Strength (f'c) =	5.0 ksi		
Unit Weight of Concrete =	150 pcf		
E_c = 57,000 * √f'c =	4.03E+06	psi	(19.2.2.1.b)
Yield Strength (fy) =	60 ksi		
E_s =	2.90E+07	psi	(20.2.2.2)
n = E_s / E_c =	7.2		
β_1 =	0.8		(Table 22.2.2.4.3)
fr = 7.5 √f'c =	530	psi	(19.2.3.1)
Rho max = (.75 ρb) =	0.0251531		



Vault Isometric View
(Joints not shown for clarity)
(All dimensions I.D.)

Design Wheel Load (Pw) =	16 kips	AASHTO HS20
Uniform Live Load =	0 psf	

Capacity Reduction Factors:

ϕ - Shear =	0.75	(Table 21.2.1)

Load Factors: (Table 5.3.1)

β - LL =	1.60	
β - DL =	1.20	
β - EL =	1.60	(5.3.8)

10-31-22

References:
1. "Specifications for Highway Bridges, 17th Ed." - AASHTO
2."Building Code Requirements for Structural Concrete" - ACI 318-14.
3. “Rectangular Concrete Tanks, 5th Ed.” – PCA Publication.
4. “Theory of Plates and Shells” – Timoshenko, S. 1959.
5. "Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures" – ASTM C890

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CHECKED BY: Date

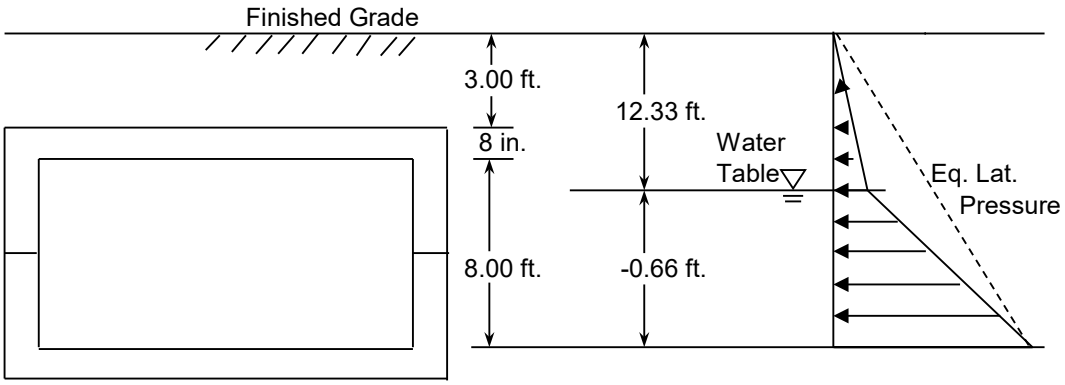
EQUIVALENT LATERAL FLUID PRESSURE:

ka =	0.33	
Unit Wt. of Soil =	120 pcf	
Max. Fill Above Structure =	3.00 ft.	(Worst Case)
Structure Inside Ht. =	8.00 ft.	
Top Slab Thickness =	8.00 in.	
Min. Watertable Depth =	12.33 ft.	

Lateral Pressure (Dry) = (Ka*Soil Wt.) 39.6 pcf

Lateral Pressure (Sat.) = (Ka*(Soil Wt.-62.4pcf)+62.4pcf) 81.4 pcf

Equivalent Lateral Pressure = **39.6 pcf**



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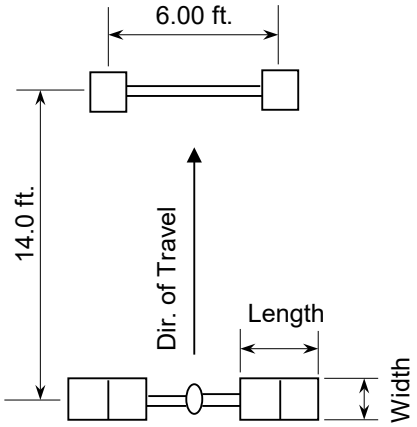
Determine Uniform Load From Wheel Live Load for Various Fill Depths

Distance Between CL of Wheel and CL of Truck: 3 ft
Wheel Load: 16 kips

Distribution Length = 1.75 x Depth of Fill + Length of Dual Wheel Dimensions
Distribution Width = 1.75 x Depth of Fill + Width of Dual Wheel Dimensions

	Length	Width	
Dual Wheel Dimensions:	1.67 ft.	0.83 ft.	AASHTO 3.30



Truck Plan View

Depth of Fill (ft)	Distrib. Length	Distrib. Width	Lengths Overlap?	DLA ft^2	Uniform Load psf
3.0	6.92	6.08	YES	78.6	407.4
3.5	7.80	6.96	YES	95.9	333.5
4.0	8.67	7.83	YES	114.9	278.6
4.5	9.55	8.71	YES	135.3	236.5
5.0	10.42	9.58	YES	157.3	203.4
5.5	11.30	10.46	YES	180.8	177.0
6.0	12.17	11.33	YES	205.9	155.4
6.5	13.05	12.21	YES	232.4	137.7
7.0	13.92	13.08	YES	260.6	122.8
7.5	14.80	13.96	YES	290.2	110.3
Min Fill: 3.0	6.92	6.08	YES	78.6	407.4
Max Fill: 3.0	6.92	6.08	YES	78.6	407.4

Design Min Fill =	3.00 ft	78.6	407.4
Design Max Fill =	3.00 ft	78.6	407.4

Note: If design fill < 3', design using concentrated load case

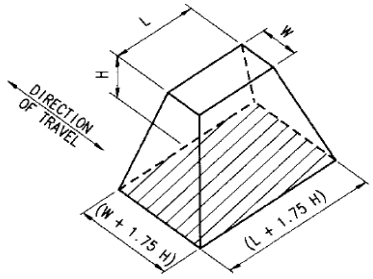


FIG. 4 Distributed Load Area

(REF "ASTM C 890-91")

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COVER SLAB DESIGN
AASHTO 3.24.6

10-31-22

Length (I.D.) =	14.00 ft	Earth Cover =	0.00 ft
Width (I.D.) =	7.00 ft	Bar cover =	1.00 in
Wall Thickness =	6.00 in		
Slab Thickness =	8.00 in	Impact =	1.30

	Short Span		Long Span	
Span (s) =	7.50 ft		14.50 ft	
Dead Loads: Soil =	0.00 ksf		0.00 ksf	
Concrete =	0.10 ksf		0.10 ksf	
Additional Uniform Dead Load =	0.00 ksf		0.00 ksf	
Total (wdl) =	0.10 ksf		0.10 ksf	
2-Way slab fac. (Distributed) =	1.000	(AASHTO 3.24.6.1)	0.000	
2-Way slab fac. (Concentrated) =	1.000		0.000	
Mdl=wdl l^2 / 8 * (2-way slab factor) =	0.70 kip-ft		0.00 kip-ft	
e = 4+.06S =	4.45 ft	(AASHTO 3.24.3.2)	4.87 ft	
p = (Pw * Impact) / e =	4.67 kips/ft		4.27 kips/ft	
Mll = ps/4*(2-way slab factor) =	8.76 kip-ft		0.00 kip-ft	
$Mu = \gamma[\beta_{(L+I)}*Mll + \beta_D*Mdl] =$	14.87 kip-ft		0.00 kip-ft	
d =	6.69 in		6.06 in	

Bottom Mat Req. Bar Size and Spacing

Short Span: As =	0.61 in. sq/ft.	Use	# 5	@	6.0 in	
Long Span: As =	0.31 in. sq/ft.	Use	# 5	@	12.0 in	
Min. Distribution Steel=.As/Span^.5=	0.22 in. sq/ft.	**OK, Min. Dist. Reinforcing Met**				
$\rho = \left[1-\left(\sqrt{1-\frac{2 \bullet M_u}{\phi b d^2 \bullet .85 f'c}}\right)\right] \bullet \frac{.85 f'c}{f_y} =$	0.00644933				0.000000	
ρ * n =	0.04640371				0	

Flexure Check:

Moment, ΦM (ACI 318 Table 21.2.2)=	0.90		0.90	
a = AsFy / 0.85f'cb =	0.722 in		0.361 in	
c=a/β1=	0.90		0.45	
Reinforcing Strain ε_t = (d-c)/c*0.003 =	0.0192	tension controlled	0.0373	tension controlled
$\varepsilon_{ty} = fy/E_s$ =	0.002		0.002	
ϕMn = ϕ*As*Fy*(d-(a/2)) =	17.47 kip-ft	**OK**	8.12 kip-ft	**OK**

Cracking Reinforcing Spacing: ACI 318 - Table 24.3.2

k = √(2ρn + (ρn)²) - ρn =	0.262		0.000	
j = 1 - (k/3) =	0.913		1.000	
M = Mdl + Mll =	9.47 kip-ft		0.00 kip-ft	
fs = M / As j d =	30.33 ksi	**OK**	0.00 ksi	**OK**
s= min(15(40000/fs)-2.5c_c,12*40000/f_s) =	16 in	**OK**	99 in	**OK**

Note: Shear considered satisfactory per AASHTO 3.24.4

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COVER SLAB DESIGN
AASHTO 3.24.6
(Continued)

MINIMUM REINFORCING - ACI 318 - Table 7.6.1.1

Short Span

As, min = Max of

((0.0018*60,000)/fy) * Ag = 0.17 in²/ft <= Controls

OR 0.0014 * Ag = 0.13 in²/ft

OK, As Provided > As Min.

Long Span

As, min = Max of

((0.0018*60,000)/fy) * Ag = 0.17 in²/ft <= Controls

OR 0.0014 * Ag = 0.13 in²/ft

OK, As Provided > As Min.

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COVER SLAB DESIGN
UNIFORM LIVE LOAD
MAX FILL
ASTM C890

10-31-22

Length (I.D.) =	14.00 ft.
Width (I.D.) =	7.00 ft.
Wall Thickness =	6.00 in
Slab Thickness =	8.00 in
Earth Cover =	3.00 ft.
Bar cover =	1.00 in

	Short Span		Long Span	
Span =	7.50 ft.		14.50 ft.	
Dead Loads: Soil =	0.36 ksf		0.36 ksf	
Concrete =	0.10 ksf		0.10 ksf	
Additional Uniform Dead Load =	0.00 ksf		0.00 ksf	
Total (wdl) =	0.46 ksf		0.46 ksf	
2-Way slab fac. (Distributed) =	1.000	(AASHTO 3.24.6.1)	0.000	
Mdl=wdl l^2 / 8 * (2-way slab factor) =	3.23 kip-ft		0.00 kip-ft	
DLA =	78.55 sf		78.55 sf	
Wll =	0.41 ksf		0.41 ksf	
Mll=wll l^2 / 8 * (2-way slab factor) =	2.86 kip-ft		0.00 kip-ft	
$Mu = \gamma[\beta_{(L+I)}*Mll + \beta_D*Mdl] =$	8.46 kip-ft		0.00 kip-ft	
d =	6.69 in		6.06 in	

Req. Bar Size and Spacing

Short Span: As =	0.61 in. sq/ft.	Use	# 5	@	6.0 in	
Long Span: As =	0.31 in. sq/ft.	Use	# 5	@	12.0 in	

$$\rho = \left[1 - \left(\sqrt{1 - \frac{2 \bullet M_u}{\phi b d^2 \bullet .85 f'c}}\right)\right] \bullet \frac{.85 f'c}{f_y} =$$

	0.00359605		0
ρ * n =	0.02587405		0

Flexure Check:

Moment, ΦM (ACI 318 Table 21.2.2)=	0.90		0.90	
a = AsFy / 0.85f'cb =	0.722 in		0.361 in	
c=a/β1=	0.90		0.45	
Reinforcing Strain ε_t = (d-c)/c*0.003 =	0.0192	tension controlled	0.0373	tension controlled
$\varepsilon_{ty} = fy/E_s$ =	0.002		0.002	
ϕMn = ϕ*As*Fy*(d-(a/2)) =	17.47 kip-ft	**OK**	8.12 kip-ft	**OK**

Cracking Reinforcing Spacing: ACI 318 - Table 24.3.2

$k = \sqrt{(2\rho n + (\rho n)^2)} - \rho n$ =	0.203		0.000	
j = 1 - (k/3) =	0.932		1.000	
M = Mdl + Mll =	6.10 kip-ft		0.00 kip-ft	
fs = M / As j d =	19.13 ksi	**OK**	0.00 ksi	**OK**
$s = \min(15(40000/fs)-2.5c_c, 12*40000/f_{s)}$ =	25 in	**OK**	99 in	**OK**

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COVER SLAB DESIGN
UNIFORM LIVE LOAD
MAX FILL
ASTM C890
(Continued)

10-31-22

Shear Check:

$Vu@\ d = \gamma[\beta LL*Wll + \beta DL*Wdl] *$
$[(span/2) - d] =$ 3.84 kips/ft
$\phi Vc =$ 8.51 kips/ft **OK**

MINIMUM REINFORCING - ACI 318 - Table 7.6.1.1

Short Span
As, min = Max of
((0.0018*60,000)/fy) * Ag = 0.17 in²/ft <= Controls
OR 0.0014 * Ag = 0.13 in²/ft
OK, As Provided > As Min.

Long Span
As, min = Max of
((0.0018*60,000)/fy) * Ag = 0.17 in²/ft <= Controls
OR 0.0014 * Ag = 0.13 in²/ft
OK, As Provided > As Min.

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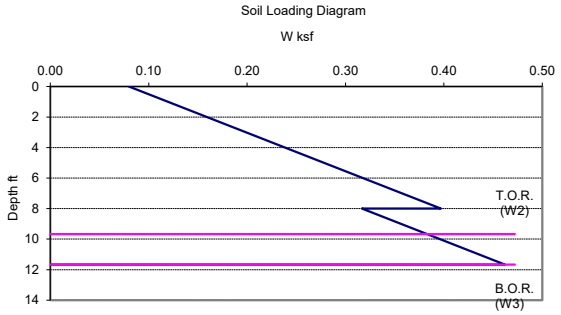
WALL DESIGN
UNIFORM LOAD
MOMENT DISTRIBUTION
RISER

Height =	2.00 ft	(Max.)
Length b =	14.00 ft	
Width c =	7.00 ft	
Wall Thickness =	6.00 in	
Use Interior Support (Y or N)	N	
Distribution Factor (l) =	0.333	
Distribution Factor (s) =	0.667	
Fixed end moment (l) =	6.90 kip-ft	
Fixed end moment (s) =	1.72 kip-ft	
Simple span moment (long) =	10.35 kip-ft	
Simple span moment (short) =	2.59 kip-ft	
Balanced moment at corner (-) =	5.17 kip-ft	
Pos. moment @ midspan (+) =	5.17 kip-ft	



Horizontal lines indicate top & bottom of riser wall

Lateral Earth Pressure

Eq. Lat. Press. =	0.040 kcf
W2 =	0.38 ksf
W3 =	0.46 ksf
Wavg =	0.42 ksf

No Surcharge

OUTSIDE FACE

Bar cover = 1.00 in

	Mu	ϕMn	Bar Sz	Sp	d	As	a
Horizontal (-)	8.28 kip-ft	11.67 kip-ft	# 4	4.0 in	4.75 in	0.59 in. sq/ft.	0.69 in

Moment, ΦM (ACI 318 Table 21.2.2)=	0.9	(varies from 0.9 for tension
c=a/β1=	0.87	controlled to 0.65 for compression controlled)
Reinforcing Strain ε_t = (d-c)/c*0.003 =	0.0135	tension controlled
ε_{ty} = fy/E_s =	0.002	

Vu@ d = γ[βEL*Wavg] * [(span/2) - d] = 4.46 kips

ϕVc = 6.05 kips

ϕVc>Vu: **OK**

Inflection pt. (from corner) 2.05 ft

ldb= 12 in

Extend bar from corner 3.05 ft

Lap (1.7*ldb)= 21 in

Cracking Reinforcing Spacing: ACI 318 - Table 24.3.2

ρ = As / b * d =	0.01033	
ρ * n =	0.07436	
k = √(2ρn + (ρn)^2) - ρn =	0.318	
j = 1 - (k/3) =	0.894	
M = Mdl + Mll =	5.17 kip-ft	
fs = M / As j d =	24.83 ksi	**OK**
s= 15(40000/fs)-2.5c_c =	19.33 in	[and <=12(40000/fs)] **OK**

10-31-22

ADELTA
SPECIALTY PRECAST CONCRETE ENGINEERS
860 Hooper Road, Endwell, NY 13760
delta-eas.com
Phone (607) 231-6600
Fax (607) 231-6650

JOB:	2022.487.001
DESCRIPTION:	14'-0" x 7'-0" x 8'-0" ID Vault
SHEET NO.:	of
CALCULATED BY:	CCFH Date 10/14/2022
CHECKED BY:	Date

Moment Distribution Riser (cont.)

MINIMUM REINFORCING - ACI 318 - Table 8.6.1.1

Horizontal

As, min = Max of

((0.0018*60,000)/fy) * Ag = 0.13 in²/ft <= Controls

OR 0.0014 * Ag = 0.10 in²/ft

OK, As Provided > As Min.

Vertical

Minimum reinforcing requirement does not apply per ACI R11.6.1

INSIDE FACE

Bar Cover = 1.00 in in

	Mu	ϕMn	Bar Sz	Sp	d	As	a
Horizontal (+)	8.28 kip-ft	11.67 kip-ft	# 4	4.0 in	4.750 in	0.59 in. sq/ft.	0.69 in

Moment, ΦM (ACI 318 Table 21.2.2)= 0.9 (varies from 0.9 for tension controlled to 0.65 for compression controlled)

c=a/β1= 0.87

Reinforcing Strain ε_t = (d-c)/c*0.003 = 0.0135 tension controlled

ε_{ty} = fy/E_s = 0.002

Cracking Check:

ρ = As / b * d = 0.01033

ρ * n = 0.07436

k = $\sqrt{(2\rho n + (\rho n)^2)} - \rho n$ = 0.318

j = 1 - (k/3) = 0.894

M = Mdl + Mll = 5.17 kip-ft

fs = M / As j d = 24.83 ksi **OK**

s= 15(40000/fs)-2.5c_c = 19.33 in [and <=12(40000/fs)] **OK**

MINIMUM REINFORCING - ACI 318 - Table 8.6.1.1

Horizontal

As, min = Max of

((0.0018*60,000)/fy) * Ag = 0.13 in²/ft <= Controls

OR 0.0014 * Ag = 0.10 in²/ft

OK, As Provided > As Min.

Vertical

Minimum reinforcing requirement does not apply per ACI R11.6.1

10-31-22

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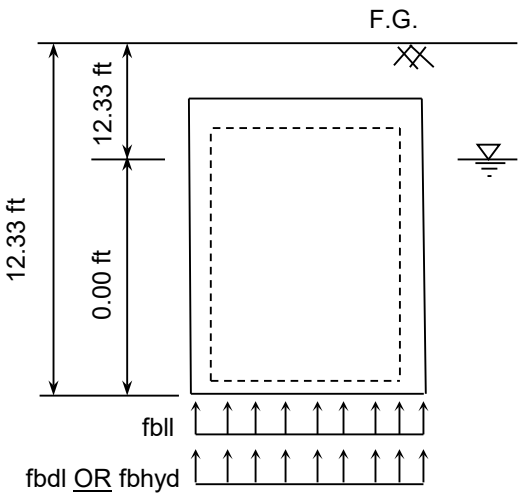
BASE SLAB DESIGN
HINGED 4 SIDES
PCA Rectangular Concrete Tanks
Case #10

	ID	OD
Length =	14.00 ft	15.00 ft
Width =	7.00 ft	8.00 ft
Wall Thickness =	6.00 in	
Slab Thickness =	8.00 in	
b/a =	2.0	
Number of Wheels=	3	

Vertical Loads:

Soil =	43.20 kips
Cover slab =	12.00 kips
Walls =	26.40 kips
Other =	
Total Dead Load =	81.60 kips
Live Load =	48.00 kips



Loading Diagram
Ref: ASTM C857 Sec 4.3

Net upward bearing pressure:

Dead Load, fbdl =	0.68 ksf	***<== Controls***
Hydrostatic, fbhyd =	0.00 ksf	(0.00 ft * 0.0624 kcf)
Live Load, fbll =	+ 0.40 ksf	
w =	1.08 ksf	
Wu =	1.46 ksf	

10-31-22

Top cage

Transverse Coeff. =	0.100
Longitudinal Coeff. =	0.038
Bar cover =	2.50 in
Transverse Moment =	5.29 kip-ft
Longitudinal Moment =	2.01 kip-ft

	Mu	ϕMn	Bar Sz	Sp	d	As	a
Transverse	7.13 kip-ft	10.18 kip-ft	# 5	8.0 in	5.19 in	0.46 in. sq/ft.	0.54 in
Longitudinal	2.71 kip-ft	8.89 kip-ft	# 5	8.0 in	4.56 in	0.46 in. sq/ft.	0.54 in

Shear Coeff.= 0.460
Vu @ 'd'= 4.40 kips
ϕVc = 6.60 kips
ϕVc>Vu: **OK**

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BASE SLAB DESIGN
HINGED 4 SIDES
PCA Rectangular Concrete Tanks
Case #10
(Continued)

	Transverse		Longitudinal	
Moment, ΦM (ACI 318 Table 21.2.2)=	0.90		0.90	(varies from 0.9 for tension
c=a/β1=	0.68		0.68	controlled to 0.65 for compression controlled)
Reinforcing Strain ε_t = (d-c)/c*0.003 =	0.0200	tension controlled	0.0172	tension controlled
ε_{ty} = fy/E_s =	0.002		0.002	

Cracking Reinforcing Spacing: ACI 318 - Table 24.3.2

	Transverse		Longitudinal	
ρ = As / b * d =	0.007393		0.008405	
ρ * n =	0.053191		0.060478	
k = $\sqrt{(2\rho n + (\rho n)^2)}$ - ρn =	0.277		0.293	
j = 1 - (k/3) =	0.908		0.902	
M =	5.29 kip-ft		2.01 kip-ft	
fs = M / As j d =	29.31 ksi	**OK**	12.73 ksi	**OK**
s =15(40000/fs)-2.5c_c =	14.22 in	**OK**	37.69 in	**OK**
[and <=12(40000/fs)]				

MINIMUM REINFORCING - ACI 318 - Table 8.6.1.1

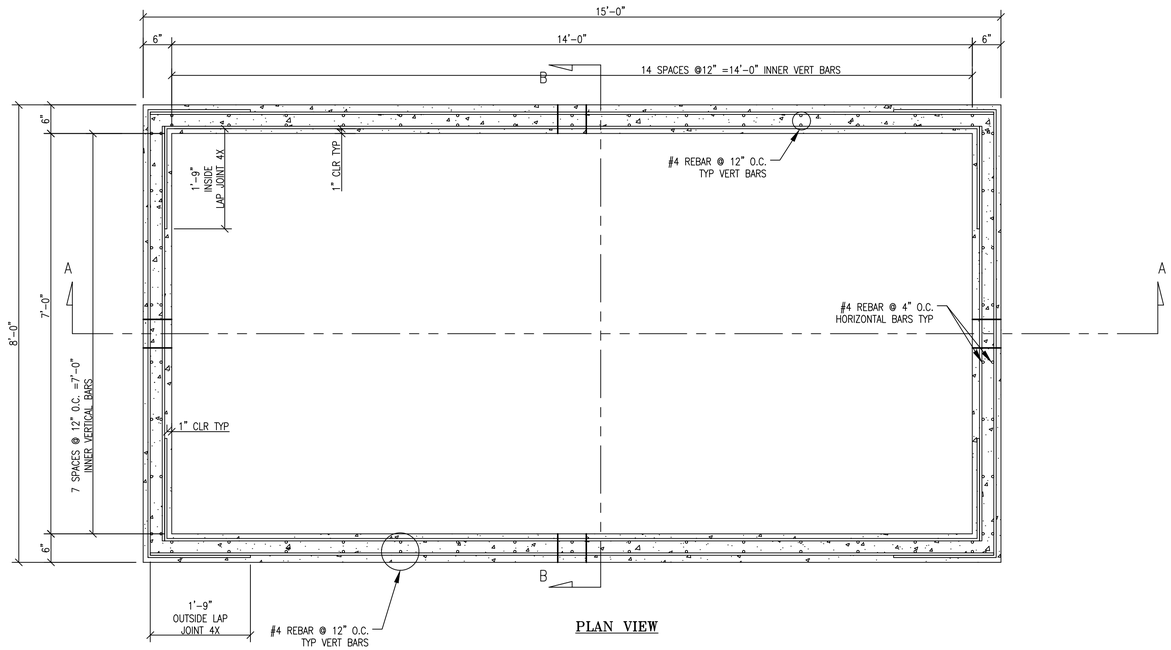
Transverse

As, min = Max of			
((0.0018*60,000)/fy) * Ag =	0.17 in²/ft	<= Controls	**OK, As Provided > As Min.**
OR 0.0014 * Ag =	0.13 in²/ft		

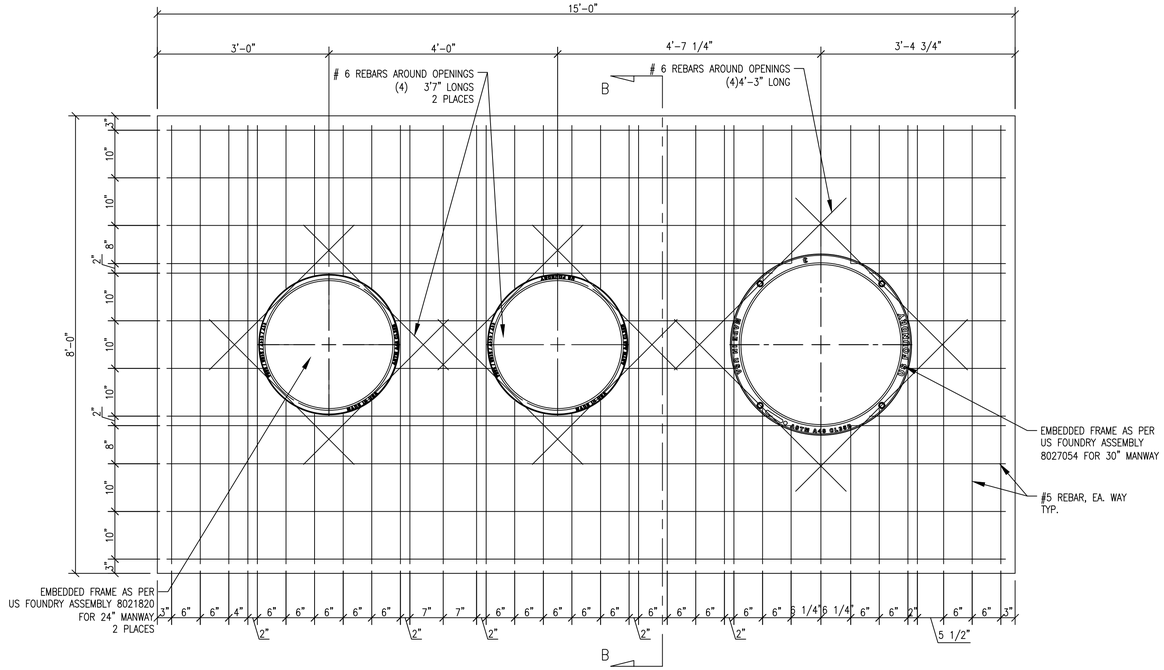
Longitudinal

As, min = Max of			
((0.0018*60,000)/fy) * Ag =	0.17 in²/ft	<= Controls	**OK, As Provided > As Min.**
OR 0.0014 * Ag =	0.13 in²/ft		

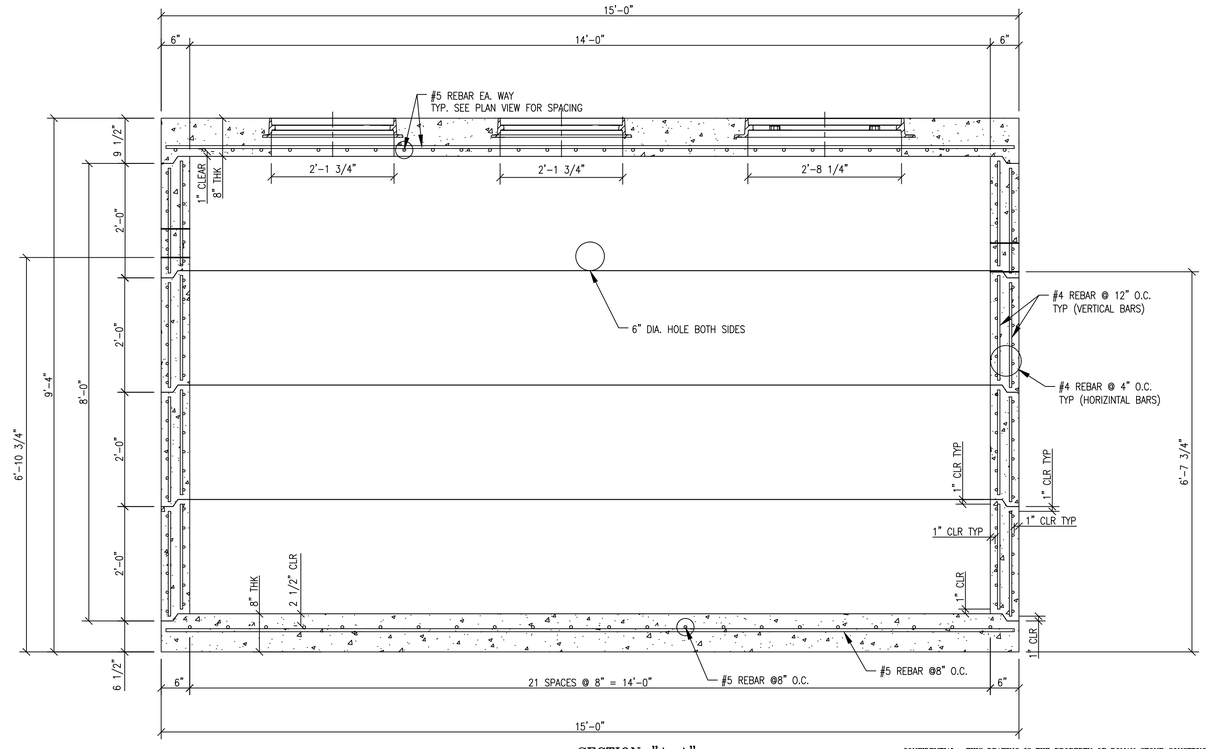
10-31-22



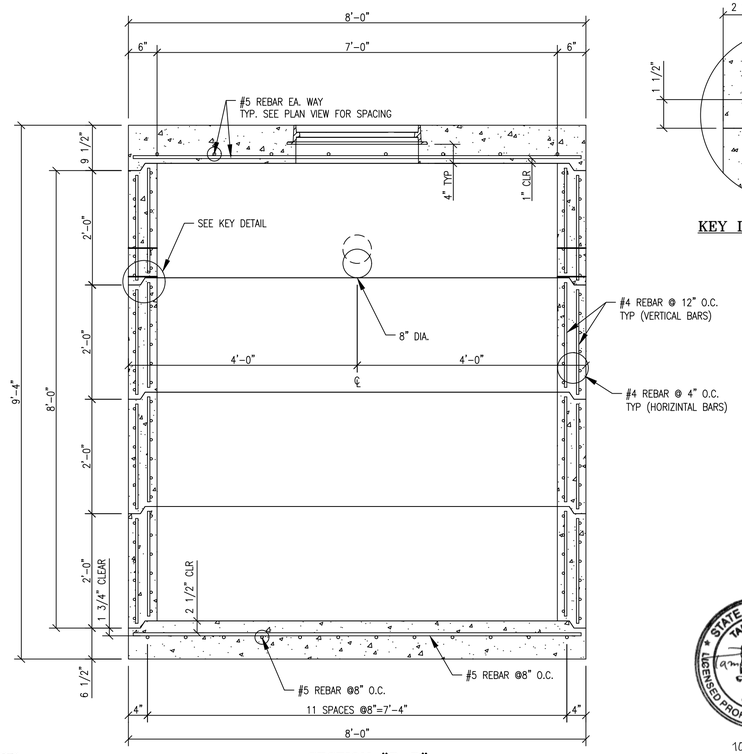
PLAN VIEW



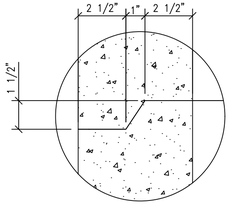
PLAN VIEW TOP SLAB



SECTION "A-A"



SECTION "B-B"



KEY DETAIL

NOTES
1. CONCRETE 5000 PSI @ 28 DAYS.
2. WEIGHT OF TANK SECTION 1 = 7,000 LBS
   WEIGHT OF TANK SECTION 2 = 7,000 LBS
   WEIGHT OF TANK SECTION 3 = 7,000 LBS
   WEIGHT OF TANK SECTION 4 = 7,000 LBS
3. WEIGHT OF TOP SLAB = 14,000 LBS
4. WEIGHT OF BOTTOM SLAB = 13,200 LBS
5. INSIDE OF CONCRETE VAULT TO BE MARKED:
   ROMAN STONE CONSTRUCTION CO.
   MONTH/DAY/YEAR
   MARK
6. 1" MIN. CLEAR COVER UNLESS NOTED OTHERWISE.
7. RATED LIFTING DEVICES WILL BE PLACED PER PRECASTER'S RECOMMENDATIONS.
8. DIMENSIONAL TOLERANCE – $\pm\frac{1}{2}$"

☐ Approved
☐ Approved As Noted

By _____ Date _____

Drawing Verified In Customary Units Only

REVISIONS		
No.	Description	Date
1	Added 8" and 6" Holes	9/30/22
2	Revised Rebar Spacing	10/19/22

ROMAN STONE CONSTRUCTION CO.
85 SOUTH FOURTH STREET
BAYSHORE N.Y. 11706 (631) 667-0566

DWG. NO: 21-FUJICLEANCEN14-1

PRODUCT:HS20 Precast Containment Vault-Cen14

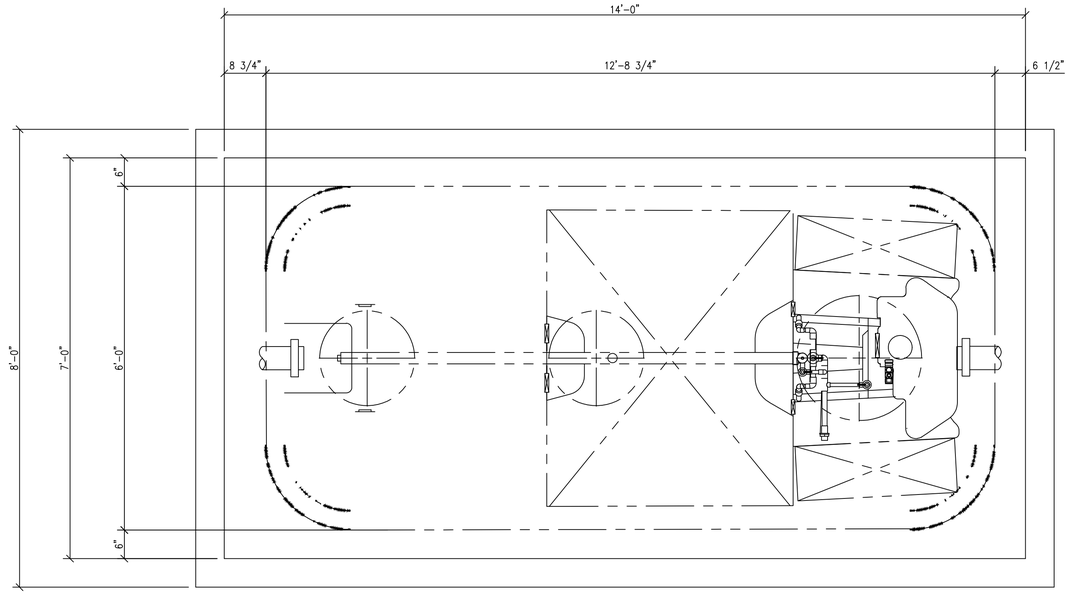
PROJECT: CEN14

CUSTOMER: FujiClean USA

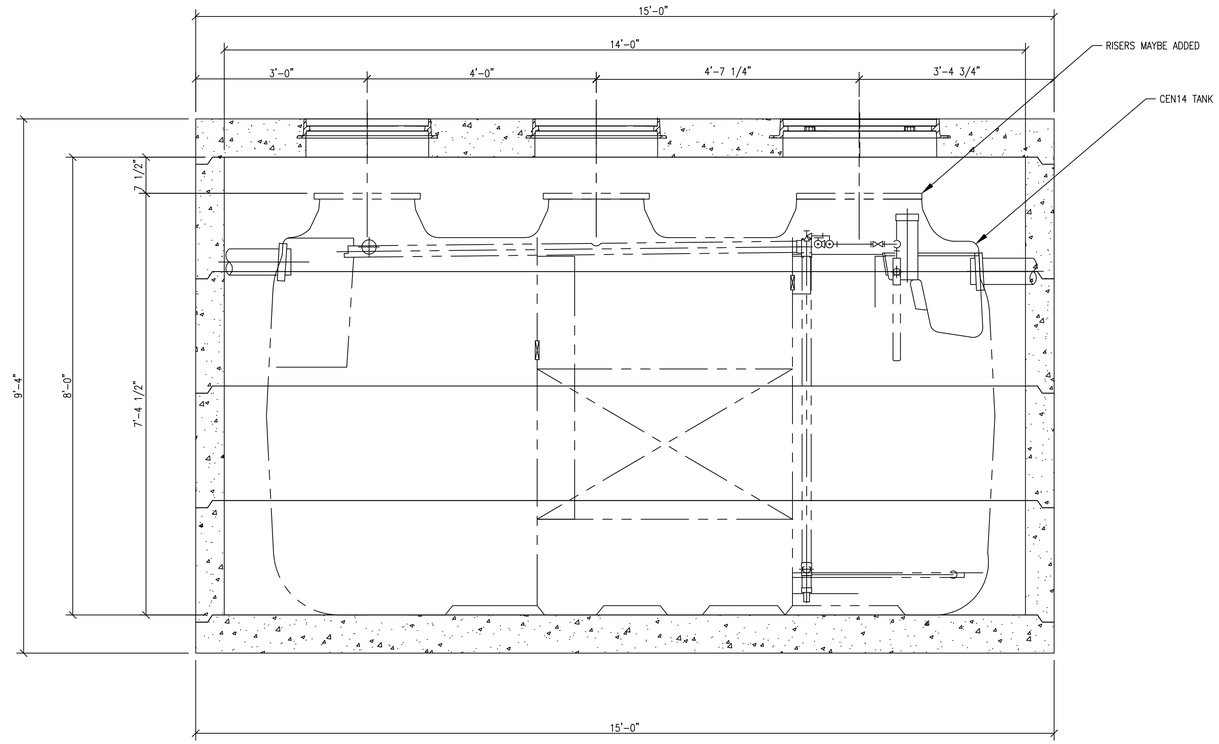
SCALE	DATE	DRAWN BY	CHECK BY	PAGE
SEE DWG.	11/09/21	BC	MS	1

STATE OF NEW YORK TAMER OSMAN 085739 LICENSED PROFESSIONAL ENGINEER

10-20-22



PLAN VIEW WITH TANK



SIDE VIEW WITH TANK

NOTES

1. CONCRETE 5000 PSI @ 28 DAYS.
2. WEIGHT OF TANK SECTION 1 = 7,000 LBS
   WEIGHT OF TANK SECTION 2 = 7,000 LBS
   WEIGHT OF TANK SECTION 3 = 7,000 LBS
   WEIGHT OF TANK SECTION 4 = 7,000 LBS
3. WEIGHT OF TOP SLAB = 14,000 LBS
4. WEIGHT OF BOTTOM SLAB = 13,200 LBS
5. TOP SLAB TO BE MARKED:
   ROMAN STONE CONSTRUCTION CO.
   MONTH/DAY/YEAR
   MARK
6. 1" MIN. CLEAR COVER UNLESS NOTED OTHERWISE.
7. RATED LIFTING DEVICES WILL BE PLACED PER PRECASTER'S RECOMMENDATIONS.
8. DIMENSIONAL TOLERANCE – ±½"

☐ Approved
☐ Approved As Noted

By _____ Date _____

Drawing Verified In Customary Units Only

REVISIONS		
No.	Description	Date

ROMAN STONE CONSTRUCTION CO.
85 SOUTH FOURTH STREET
BAYSHORE N.Y. 11706 (631) 667-0566

DWG. NO: 21-FUJICLEANCEN14-2

PRODUCT:HS20 Precast Containment Vault-Cen14

PROJECT: CEN14

CUSTOMER: FujiClean USA

SCALE	DATE	DRAWN BY	CHECK BY	PAGE
SEE DWG.	11/09/21	BC	MS	2

STATE OF NEW YORK * YAMER OSMAN * LICENSED PROFESSIONAL ENGINEER 085739

10-20-22