COUNTY OF SUFFOLK

STEVEN BELLONE
SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

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

January 20, 2023

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: NS-003 Fuji Clean CEN 5 & CEN 7 HS-20 Topping Slab

Dear Mr. Osman,

The Suffolk County Department of Health Services, Division of Environmental Quality, Office of Ecology has received and reviewed your design computations prepared for Advanced Wastewater Solutions, Project No. 2023.030.001, with your signature and sealed on 1/19/2023 for the "CEN5/7 Precast Cover Slabs 10'-0" O.D.".

Based on the information provided, the Department of Health Services approves the use of this precast concrete structure as a top slab for precast concrete rings previously approved by SCDHS, SCDPW or NYSDOT in traffic areas with a maximum burial depth of 2-feet. 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.

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: Kevin McGowin (Advanced Wastewater Solutions)
Bryan McGowin (Advanced Wastewater Solutions)
Scott Samuelson (Fuji Clean USA)
Mike Dunn (Fuji Clean USA)

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

Project Number: 2023.030.001

DESIGN COMPUTATIONS FOR

CEN5/7 Precast Cover Slabs
10'-0" O.D.

1-19-23

PREPARED FOR:

Advanced Wastewater Solutions
Post Office Box 1622
Southampton, NY 11969

PREPARED BY:

DELTA
SPECIALTY PRECAST CONCRETE ENGINEERS

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

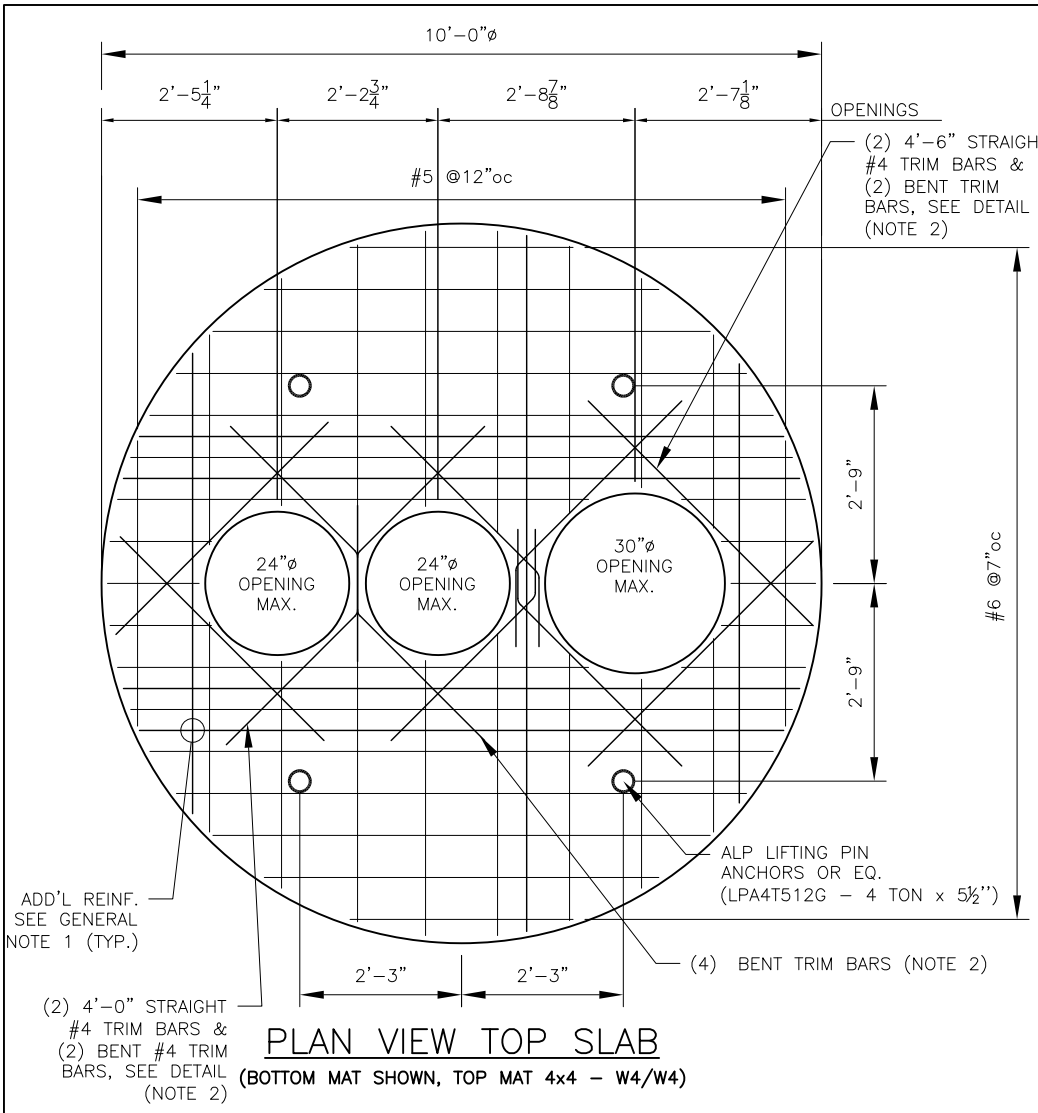
ACCEPTED BY THE SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES (DEPARTMENT) BASED ON INFORMATION PROVIDED BY ENGINEER.

SCDHS Approval No.: NS-003

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(s). 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.

1/20/2023
APPROVAL DATE

Ken Zegel, P.E.



PLAN VIEW TOP SLAB

(BOTTOM MAT SHOWN, TOP MAT 4x4 - W4/W4)

DESIGN NOTES

AS PROVIDED BY EOR:

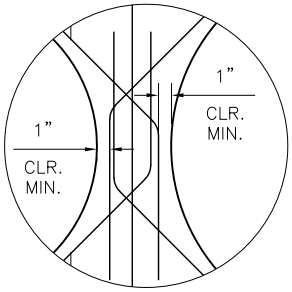
1. DESIGN IN ACCORDANCE WITH ASTM C-478 FOR HS-20 LOADING.

ASSUMPTIONS: (TO BE VERIFIED BY EOR)

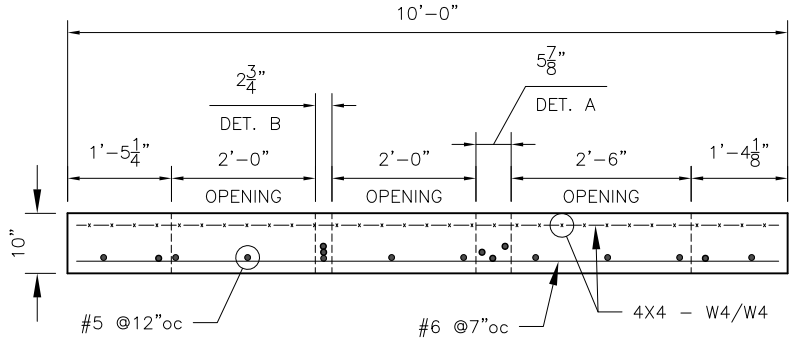
1. EARTH COVER = 0' - 2'
2. UNIT WEIGHT OF SOIL = 120 PCF
3. BAR COVER = 2" U.N.O.
4. f'c @ 28 DAYS = 4,000 PSI (MIN.)
5. REINFORCEMENT =
   BAR PER ASTM A615, GRADE 60
   WWR PER ASTM A1064 GRADE 65

GENERAL NOTES:

1. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
2. TRIM OPENINGS WITH DIAGONAL #4 BARS, EXTEND BARS MINIMUM 12" BEYOND OPENINGS, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
3. THIS IS A REINFORCING SUMMARY, REFERENCE ADVACED WASTEWATER SOLUTIONS DRAWINGS FOR; OPENING SIZES, QUANTITY, LOCATION AND OTHER INFORMATION.
4. LIFTING AND HANDLING BY OTHERS.

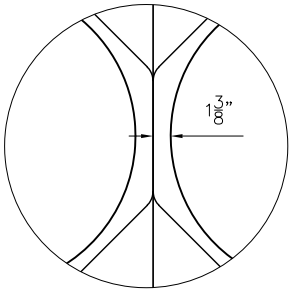


DETAIL A

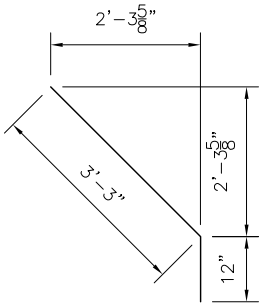


TYPICAL REINFORCING SECTION

(BAR COVER 2" U.N.O.)



DETAIL B



BENT TRIM BAR DETAIL

REV.NO.	DATE	REVISION
1 VCE	1/19/23	ADDED DETAILS

PREPARED FOR: AWS Advanced Wastewater Solutions; FujiClean USA Toward Clean Water...

PREPARED BY:

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

DATE: 1/12/23	SHEET TITLE: SUMMARY DRAWING	DRWN BY: GAS	
SCALE: N.T.S.		CKD BY:	
PROJECT: CEN 5 & CEN 7 PRECAST COVER SLABS - 10'-0" O.D.			
CONTRACTOR:		DWG. I.D. RS-01	
DELTA PROJ. NO.: 2023.030.001		SHT. NO. 1 OF 1	

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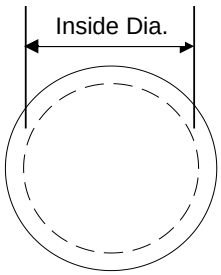
JOB: 2023.030.001 - Advanced Wastewater
DESCRIPTION: 10' OD MH Slab
SHEET NO.: of
CALCULATED BY: GAS Date 1/12/23
CHECKED BY: Date

PRECAST ROUND MANHOLE DESIGN

DESCRIPTION

Inside Diameter (I.D.) =	9.33 ft
Wall Height (I.D.) =	1.00 ft
Wall Thickness =	4.00 in
Base Slab Thickness =	0.00 in
Cover Slab Thickness =	10.00 in
Earth Cover (Min.) =	0.00 ft
Earth Cover (Max) =	2.00 ft
Min. Watertable Depth =	0.00 ft

Denotes input field



Round Manhole
Plan View
(All dimensions I.D.)

TECHNICAL DATA

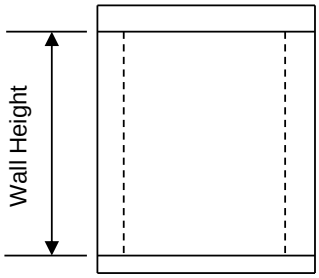
Concrete Strength (f'c) =	4.0 ksi	
Yield Strength (fy) =	60 ksi	
Equivalent Lateral Fluid Pressure =	0.091 kcf	
LL Surcharge =	0.08 ksf	
Depth Below F.G. to Apply Surcharge =	8.00 ft	
Unit Weight of Soil =	120 pcf	
Unit Weight of Concrete =	150 pcf	
$E_c = 57{,}000 * \sqrt{f'c}$ =	3.60E+06	psi
Es =	2.90E+07	psi
$n = E_s / E_c$ =	8.0	
$\beta 1 = (.85-.05(fc-4))$ =	0.85	
$fr = 7.5 \sqrt{f'c}$ =	474	psi
Rho max = (.75 ρb) =	0.0213801	
Zmax =	130	Severe Exposure
Design Wheel Load (Pw) =	16 kips	AASHTO HS20
Uniform Live Load =	0 psf	

Capacity Reduction Factors:

ϕ - Moment =	0.90
ϕ - Shear =	0.85

Load Factors:

γ =	1.30
β - LL =	1.67
β - DL =	1.00
β - EL =	1.30



Round Manhole
Elevation View
(Joints not shown for clarity)
(All dimensions I.D.)

References:
1. "Specifications for Highway Bridges, 17th Ed." - AASHTO
2."Building Code Requirements for Structural Concrete" - ACI 318.
3. "Standard Specification for Precast Reinforced Concrete Manhole Sections" - ASTM C478.
4. "Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures" – ASTM C890

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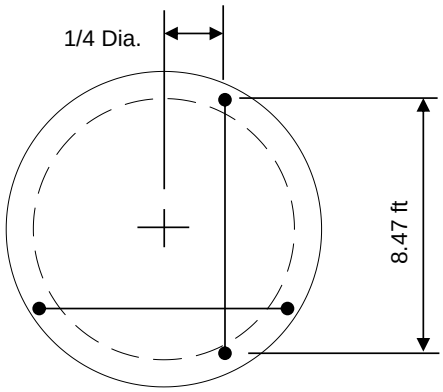
DESCRIPTION: 10' OD MH Slab
SHEET NO.: of
CALCULATED BY: GAS Date 1/12/23
CHECKED BY: Date

COVER SLAB DESIGN
CONCENTRATED LIVE LOAD

Wall Thickness =	4.00 in
Slab Thickness =	10.00 in
Earth Cover =	1.00 ft
Bar cover =	2.00 in
Impact =	1.30



One Way Slab

Avg. Span (s) =	8.47 ft
Dead Loads: Soil =	0.12 ksf
Concrete =	0.13 ksf
Additional Uniform Dead Load =	0.00 ksf
Total (wdl) =	0.25 ksf

Mdl=wdl l^2 / 8 =	2.19 kip-ft	
e = 4+.06S =	4.51 ft	(AASHTO 3.24.3.2)
p = (Pw * Impact) / e =	4.61 kips/ft	
Mll = ps / 4 =	9.76 kip-ft	
$Mu = \gamma[\beta(L+I)*Mll + \beta D*Mdl] =$	24.05 kip-ft	
'd' =	7.63 in	

Req. Bar Size and Spacing

Main Reinforcing: As =	0.76 in.²/ft.	Use	# 6	@	7.0 in
Distribution Steel=.As/Span^.5=	0.26 in. sq/ft.	Use	# 5	@	14.0 in

ρ = As / b * d =	0.00827703	
ρ * n =	0.06658366	
Flexure Check:		
a = AsFy / 0.85f'cb =	1.114 in	
$\phi Mn = \phi*As*Fy*(d-(a/2)) =$	24.09 kip-ft	**OK**
Cracking Check:		
$k = \sqrt{(2\rho n + \rho n^2)} - \rho n =$	0.304	
j = 1 - (k/3) =	0.899	
M = Mdl + Mll =	11.96 kip-ft	
fs = M / As j d =	27.66 ksi	**OK**
dc =	2.375 in	
A = 2 * dc * Spacing =	33.3 in²	
$Z = fs \sqrt[3]{(dc * A)} =$	118 kips/in	**OK**

Note: Shear considered satisfactory per AASHTO 3.24.4

Check minimum reinforcement requirements per AASHTO 8.17.1
Note: Minimum As shall be at least 1/8 sq. in./ft (AASHTO 8.20.1)

$\phi Mn \geq 1.2*Mcr$

Mcr =	7.91 kip-ft	
1.2 Mcr =	9.49 kip-ft	**OK**

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SHEET NO.: of
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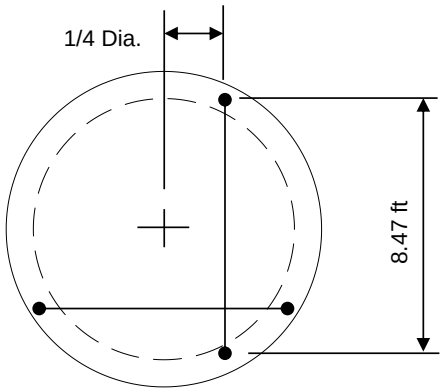
COVER SLAB DESIGN
CONCENTRATED LIVE LOAD

Wall Thickness =	4.00 in
Slab Thickness =	10.00 in
Earth Cover =	2.00 ft
Bar cover =	2.00 in
Impact =	1.20



One Way Slab

Avg. Span (s) =	8.47 ft
Dead Loads: Soil =	0.24 ksf
Concrete =	0.13 ksf
Additional Uniform Dead Load =	0.00 ksf
Total (wdl) =	0.37 ksf

Mdl=wdl l^2 / 8 =	3.27 kip-ft	
e = 4+.06S =	4.51 ft	(AASHTO 3.24.3.2)
p = (Pw * Impact) / e =	4.26 kips/ft	
Mll = ps / 4 =	9.01 kip-ft	
$Mu = \gamma[\beta(L+I)*Mll + \beta D*Mdl] =$	23.82 kip-ft	
'd' =	7.63 in	

Req. Bar Size and Spacing

Main Reinforcing: As =	0.76 in.²/ft.	Use	# 6	@	7.0 in
Distribution Steel=.As/Span^.5=	0.26 in. sq/ft.	Use	# 5	@	14.0 in

ρ = As / b * d =	0.00827703	
ρ * n =	0.06658366	
Flexure Check:		
a = AsFy / 0.85f'cb =	1.114 in	
$\phi Mn = \phi*As*Fy*(d-(a/2)) =$	24.09 kip-ft	**OK**
Cracking Check:		
$k = \sqrt{(2\rho n + \rho n^2)} - \rho n =$	0.304	
j = 1 - (k/3) =	0.899	
M = Mdl + Mll =	12.28 kip-ft	
fs = M / As j d =	28.41 ksi	**OK**
dc =	2.375 in	
A = 2 * dc * Spacing =	33.3 in²	
$Z = fs \sqrt[3]{(dc * A)} =$	122 kips/in	**OK**

Note: Shear considered satisfactory per AASHTO 3.24.4

Check minimum reinforcement requirements per AASHTO 8.17.1
Note: Minimum As shall be at least 1/8 sq. in./ft (AASHTO 8.20.1)

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Mcr =	7.91 kip-ft	
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