



WATER & SANITATION AGENCY (LDA)
PLANNING & DESIGN DIRECTORATE
ZAHOR ELAHI ROAD, GULBERG-II LAHORE.

To,

Dy. Managing Director (Engg.), WASA Lahore.

Dy. Managing Director (O&M), WASA Lahore.

No. D(P&D)/ 1761-65

Dated: 09-12-2022

Subject: **DESIGN OF RCC SEWER PIPES AS PER ASTM C76-20**

Please find enclosed herewith a copy of standard drawings and reinforcement design/ details of RCC sewer pipes (from 12" to 72" i/d) prepared according to ASTM C76-20 standards and specifications, for information and further necessary action please.

Encl: As above.


(Zeeshan Bilal)

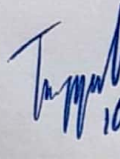
DIRECTOR (PLANNING & DESIGN)
WASA, LDA, LAHORE

Cc:

1. Managing Director, WASA Lahore.
- ✓ 2. Dy. Director-IV (P&D), WASA Lahore.
3. Dy. Director (QCD), WASA Lahore (with the direction to ensure manufacturing of RCC Sewer pipes as per standards and specifications of ASTM C76-20 in WASA approved pipe manufacturing factories)



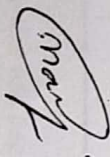
AD-I

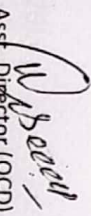

10/12/22

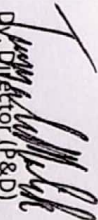
LONGITUDINAL REINFORCEMENT DESIGN FOR R.C.C SEWER PIPES
FROM 12" TO 72" DIAMETER
ASTM (C76-20) WALL B CLASS III - IV

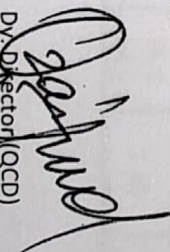
Dia of Pipe (in)	12	15			18		21		24		27		30		33		36		42		48		54		60		66		72
Class of Pipe	III/IV	III	IV	III	IV	III	IV	III	IV	III/IV	III	III/IV	III	III	IV	III	IV	III	IV	III	IV	III	IV	III	IV	III	IV	III	IV
Dia of Longitudinal Bars (in)	5/32	5/32	3/16	5/32	3/16	5/32	1/4	5/32	1/4	3/8	1/4	3/8	1/4	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2	3/8	1/2
No. of Bars	6	6	6	6	6	6	6	6	6	6	6	8	6	8	7	6	7	6	8	8	8	8	8	8	8	8	8	8	8

Note: From 33" dia pipe onwards, given number of Longitudinal Bars will be used in both inner as well as outer circumferential reinforcement.


Asst. Director (P&D)
WASA Lahore


Asst. Director (QCD)
WASA Lahore


Dy. Director (P&D)
WASA Lahore

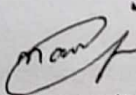

Dy. Director (QCD)
WASA Lahore

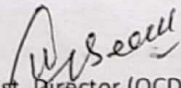
**CIRCUMFERENTIAL REINFORCEMENT DESIGN FOR R.C.C SEWER PIPES
FROM 12" TO 33" DIAMETER
ASTM (C76-20) WALL B CLASS III**

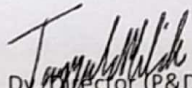
Dia	Barrel Reinforcement									Bell/Spigot/Socket Reinforcement							3-Edge Bearing Load	
	Wall Thickness	Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load
in	in	sq.in/linear feet	in	sq.in	linear feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot
12	2	0.07	5/32	0.02	7.71	0.54	28	3.30	14	5/32	0.33	0.02	0.02	2	2	19	0.61	0.91
15	2.25	0.07	5/32	0.02	7.71	0.54	28	3.30	17	5/32	0.33	0.02	0.02	2	2	22	0.77	1.14
18	2.5	0.07	5/32	0.02	7.75	0.54	28	3.32	20	5/32	0.33	0.02	0.02	2	2	26	0.92	1.36
21	2.75	0.07	5/32	0.02	7.92	0.55	29	3.28	24	5/32	0.33	0.02	0.02	2	2	26	1.07	1.59
24	3	0.07	5/32	0.02	7.92	0.55	29	3.28	26	5/32	0.33	0.02	0.02	2	2	33	1.23	1.82
27	3.25	0.16	1/4	0.05	7.67	1.24	25	3.72	30	1/4	0.33	0.05	0.05	Socket: 3 Spigot: 3	1.2	32 28.5	1.38	2.04
30	3.5	0.18	1/4	0.05	7.67	1.38	28	3.27	33	1/4	0.33	0.06	0.05	Socket: 3 Spigot: 3	1.4	35.6 31.5	1.53	2.27
33	3.75	0.2	1/4	0.05	7.67	1.53	31	2.96	36	1/4	0.33	0.07	0.05	Socket: 3 Spigot: 3	1.4	38.6 34.5	1.69	2.5

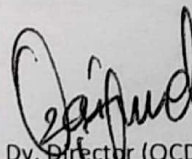
Note:

- 1- Steel reinforcement has been designed as per ASTM (C76-20).
- 2- The number of rings have been calculated from the specified cross sectional area or for minimum specified spacing.
- 3- The diameter of collar/ neck circumferential ring shall be determined as per the specified spacing of circumferential barrel rings.


Asst. Director (P&D)
WASA Lahore


Asst. Director (QCD)
WASA Lahore


Dy. Director (P&D)
WASA Lahore


Dy. Director (QCD)
WASA Lahore

CIRCUMFERENTIAL REINFORCEMENT DESIGN FOR R.C.C SEWER PIPES
FROM 36" TO 72" DIAMETER
ASTM (C76-20) WALL B CLASS III

Dia		Wall Thickness	Inner Circular Reinforcement								Spigot Reinforcement							3-Edge Bearing Load	
Dia	Thickness	Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load	
																	ton/foot	ton/foot	
in	in	sq.in/linear feet	in	sq.in	feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot	
Outer Circular Reinforcement																			
Dia	Wall Thickness	Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load	
in	in	sq.in/linear feet	in	sq.in	feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot	
36	4	0.1	3/16	0.03	7.67	0.764	28	3.27	42	3/16	0.33	0.03	0.03	3	1.38	42	1.84	2.72	
42	4.5	0.12	1/4	0.05	7.67	0.912	21	4.34	49	1/4	0.33	0.04	0.05	3	1.46	49	2.15	3.18	
48	5	0.14	1/4	0.05	7.67	1.064	22	4.15	56	1/4	0.33	0.05	0.05	3	1.46	56	2.45	3.63	
54	5.5	0.17	1/4	0.05	7.67	1.285	26	3.49	63	1/4	0.33	0.07	0.05	3	1.54	63	2.76	4.09	
60	6	0.2	1/4	0.05	7.67	1.512	31	2.93	69	1/4	0.33	0.08	0.05	3	1.54	69	3.06	4.54	
66	6.5	0.24	3/8	0.11	7.67	1.799	16	5.62	76	1/4	0.33	0.10	0.05	3	1.67	76	3.37	4.99	
72	7	0.29	3/8	0.11	7.67	2.180	20	4.51	83	3/8	0.33	0.12	0.11	3	1.63	83	3.68	5.45	
Socket Reinforcement																			
3-Edge Bearing Load																			
3-Edge Bearing Load																			

Note:

- 1- Steel reinforcement has been designed as per ASTM (C76-20).
- 2- The number of rings have been calculated from the specified cross sectional area or for minimum specified spacing.
- 3- The diameter of collar/ neck circumferential ring shall be determined as per the specified spacing of circumferential barrel rings.

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Asst. Director (P&D)
WASA Lahore

W. Saeed
Asst. Director (QCD)
WASA Lahore

T. M. Malik
Asst. Director (P&D)
WASA Lahore

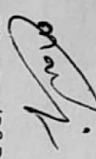
Q. J. Ahmad
Asst. Director (QCD)
WASA Lahore

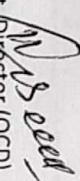
CIRCUMFERENTIAL REINFORCEMENT DESIGN FOR R.C.C SEWER PIPES
FROM 12" TO 30" DIAMETER
ASTM (C76-20) WALL B CLASS IV

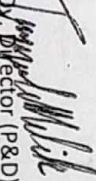
Dia	Barrel Reinforcement									Bell/Spigot/Socket Reinforcement								3-Edge Bearing Load	
	Wall Thickness	Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load	
in	in	sq.in/linear feet	in	sq.in	feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot	
12	2	0.07	5/32	0.02	7.71	0.54	28	3.30	14	5/32	0.33	0.02	0.02	2	2	19	0.91	1.36	
15	2.25	0.1	3/16	0.03	7.71	0.77	28	3.30	17	3/16	0.33	0.03	0.03	2	2	22	1.13	1.7	
18	2.5	0.14	3/16	0.03	7.75	1.09	39	2.38	20	3/16	0.33	0.05	0.03	2	2	26	1.36	2.04	
21	2.75	0.2	1/4	0.05	7.92	1.58	32	2.97	24	1/4	0.33	0.07	0.05	2	2	30	1.59	2.38	
24	3	0.27	1/4	0.05	7.92	2.14	44	2.16	26	1/4	0.33	0.09	0.05	2	2	33	1.81	2.72	
27	3.25	0.31	3/8	0.11	7.67	2.40	24	3.87	30	3/8	0.33	0.09	0.11	Socket: 3 Spigot: 3	1.2	31.8 28.7	2.04	3.06	
30	3.5	0.35	3/8	0.11	7.67	2.67	24	3.82	33	3/8	0.33	0.12	0.11	Socket: 3 Spigot: 3	1.4	35.6 31.5	2.27	3.4	

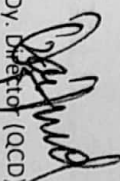
Note:

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- 2- The number of rings have been calculated from the specified cross sectional area or for minimum specified spacing.
- 3- The diameter of collar/ neck circumferential ring shall be determined as per the specified spacing of circumferential barrel rings.


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 WASA Lahore


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CIRCUMFERENTIAL REINFORCEMENT DESIGN FOR R.C.C SEWER PIPES
FROM 33" TO 72" DIAMETER
ASTM (C76-20) WALL B CLASS IV

ASTM (C76-20) WALL B CLASS IV																		
Dia	Wall Thickness	Inner Circular Reinforcement								Spigot Reinforcement							3-Edge Bearing Load	
		Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load
in	in	sq.in/linear feet	in	sq.in	feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot
33	3.75	0.27	3/8	0.11	7.67	2.063	23	3.99	35	1/4	0.33	0.09	0.05	3	1.38	35	2.49	3.74
36	4	0.3	3/8	0.11	7.67	2.292	23	3.99	38	1/4	0.33	0.10	0.05	3	1.38	38	2.72	4.08
42	4.5	0.35	3/8	0.11	7.67	2.661	24	3.80	44	1/4	0.33	0.13	0.05	3	1.46	44	3.17	4.76
48	5	0.42	3/8	0.11	7.67	3.193	29	3.15	50	3/8	0.33	0.15	0.11	3	1.46	50	3.63	5.44
54	5.5	0.5	1/2	0.20	7.67	3.780	19	4.77	56	3/8	0.33	0.19	0.11	3	1.54	56	4.08	6.12
60	6	0.59	1/2	0.20	7.67	4.460	23	3.94	63	3/8	0.42	0.23	0.11	3	1.54	63	4.54	6.81
66	6.5	0.69	1/2	0.20	7.67	5.173	26	3.46	69	1/2	0.42	0.29	0.20	3	1.67	69	4.99	7.49
72	7	0.79	1/2	0.20	7.67	5.939	30	3.01	75	1/2	0.42	0.32	0.20	3	1.63	75	5.44	8.17

Dia	Wall Thickness	Outer Circular Reinforcement							Socket Reinforcement							3-Edge Bearing Load		
		Steel Ratio	Bar Size	Bar Area	Barrel Length	Steel Required	No. of Rings	Spacing	Dia of Ring	Bar Size	Bell Length	Steel Required	Area of Bar	No. of Rings	Spacing	Dia of Ring	Proof Load	Ultimate Load
in	in	sq.in/linear feet	in	sq.in	feet	sq.in	nos	in	in	in	feet	sq.in	sq.in	nos	in	in	ton/foot	ton/foot
33	3.75	0.16	1/4	0.05	7.67	1.223	25	3.67	39	1/4	0.33	0.06	0.05	3	1.38	39	2.49	3.74
36	4	0.18	1/4	0.05	7.67	1.375	28	3.27	42	1/4	0.33	0.06	0.05	3	1.38	42	2.72	4.08
42	4.5	0.21	1/4	0.05	7.67	1.596	33	2.76	49	1/4	0.33	0.08	0.05	3	1.46	49	3.17	4.76
48	5	0.24	3/8	0.11	7.67	1.824	19	4.80	56	3/8	0.33	0.09	0.11	3	1.46	56	3.63	5.44
54	5.5	0.3	3/8	0.11	7.67	2.268	21	4.32	63	3/8	0.33	0.12	0.11	3	1.54	63	4.08	6.12
60	6	0.35	3/8	0.11	7.67	2.646	24	3.78	69	3/8	0.42	0.13	0.11	3	1.54	69	4.54	6.81
66	6.5	0.41	1/2	0.20	7.67	3.074	16	5.62	76	1/2	0.42	0.17	0.20	3	1.67	76	4.99	7.49
72	7	0.47	1/2	0.20	7.67	3.533	18	5.01	83	1/2	0.42	0.19	0.20	3	1.63	83	5.44	8.17

Note:

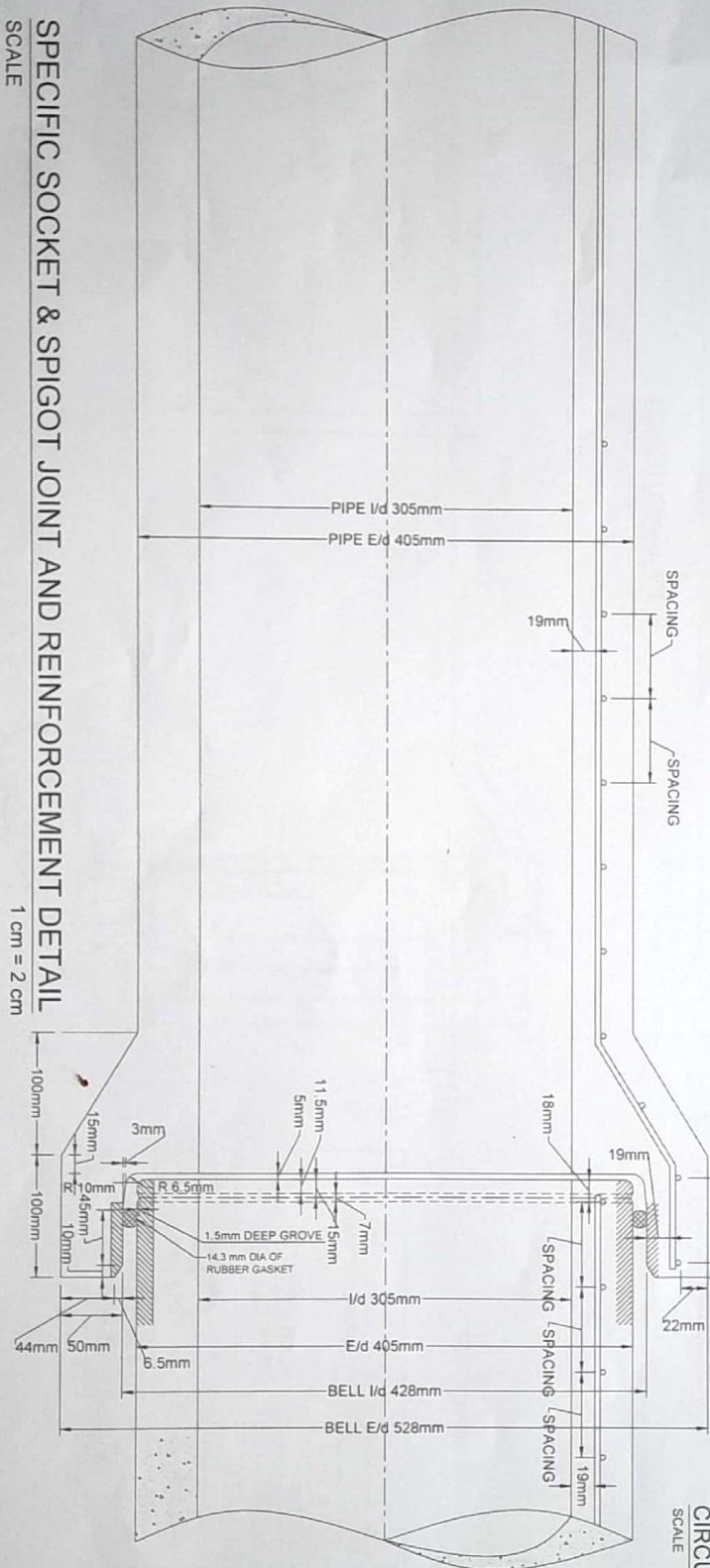
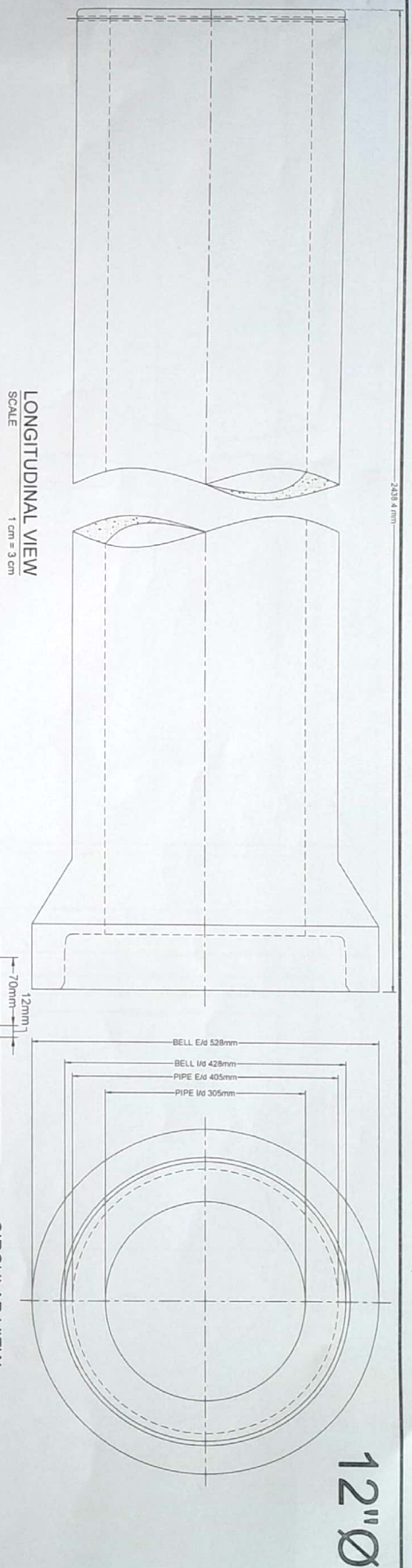
- 1- Steel reinforcement has been designed as per ASTM (C76-20).
- 2- The number of rings have been calculated from the specified cross sectional area or for minimum specified spacing.
- 3- The diameter of collar/ neck circumferential ring shall be determined as per the specified spacing of circumferential barrel rings.

Asst. Director (P&D)
WASA Lahore

Asst. Director (QCD)
WASA Lahore

Director (P&D)
WASA Lahore

Director (QCD)
WASA Lahore



LONGITUDINAL REINFORCEMENT			NO OF BARS
CLASS	Dia of Bar		
	In	mm	
III	5/32	3.96	6
IV	5/32	3.96	6

BARS TO BE EQUALLY
SPACED AROUND 360°

SPECIFIC SOCKET & SPIGOT JOINT AND REINFORCEMENT DETAIL
SCALE 1 cm = 2 cm

REINFORCEMENT FOR BELL

CLASS	Dia of bar		No of Ring	Dia of Ring		Spacing of Rings	
	In	mm		In	mm	In	mm
III	5.02	3.00	2	18.66	474.00	2	50.8
IV	5.02	3.00	2	19.00	474.00	2	50.8

REINFORCEMENT FOR BARREL

CLASS	WALL THICKNESS		Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	In	mm	In	mm		In	mm	In	mm
III	2	50.8	5/32	3.86	28	13.81	351.00	3.30	83.82
IV	2	50.8	5/32	3.86	28	13.81	351.00	3.30	83.82

STRENGTH REQUIRET/FT. LENGTH

CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH, psi
		Lbs	Tons	Lbs	Tons	
III	B	1350	0.61	2000	0.91	4000
IV	B	2000	0.91	3000	1.36	4000

RUBBER RING			
SIZE		INSIDE DIA	
in	mm	in	mm
5/16	14.30	15.03	382

WASA

TITLE: CONSTRUCTION DETAIL OF 12" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20

PLANNING & DESIGN DIRECTORATE

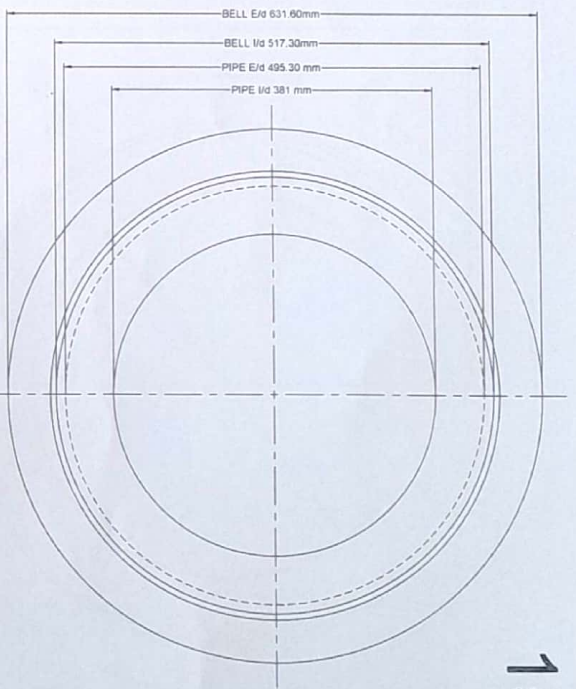
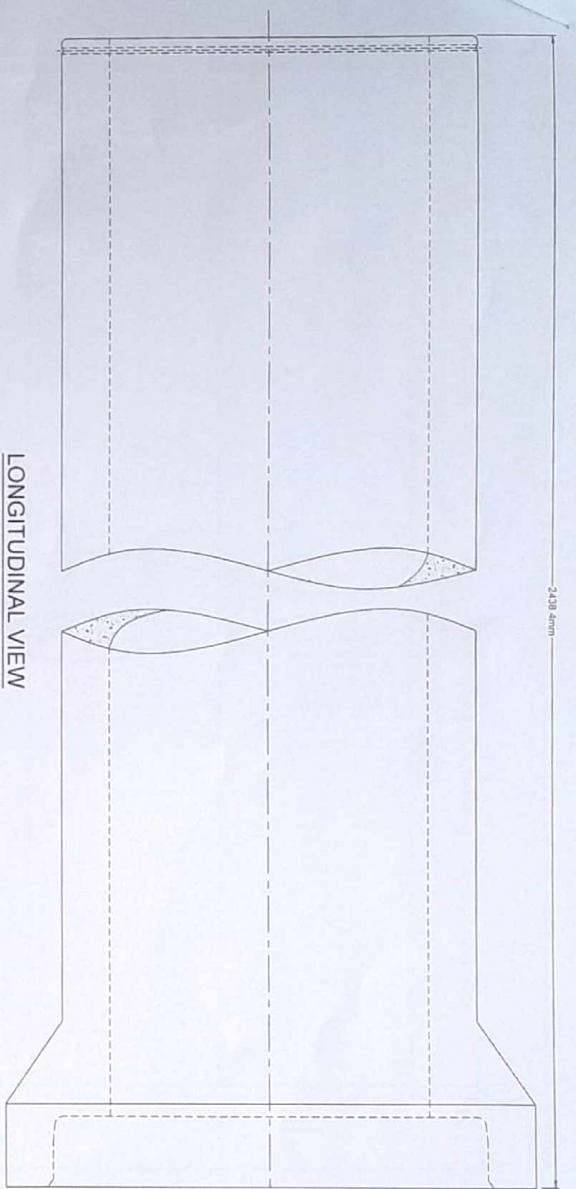
	
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DATED: 17.11.202

SCALE: AS SHOWN

LONGITUDINAL VIEW

SCALE: 1cm = 3cm



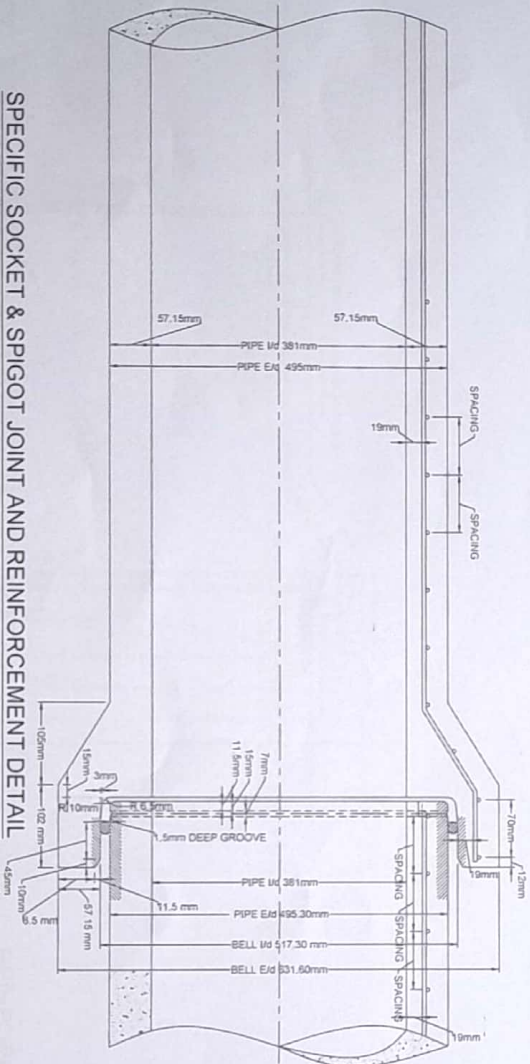
15"Ø

CIRCULAR VIEW

SCALE: 1cm = 3cm

SPECIFIC SOCKET & SPIGOT JOINT AND REINFORCEMENT DETAIL

1cm=3cm



REINFORCEMENT FOR BARREL

CLASS	WALL THICKNESS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
	In	In	In	In	In
III	2.25	57.15	5/32	3.96	28
IV	2.25	57.15	3/16	4.76	28

REINFORCEMENT FOR BELL

CLASS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
	In	In	In	In
III	5/32	3.96	2	22.16
IV	3/16	4.76	2	22.24

LONGITUDINAL REINFORCEMENT

CLASS	Dia of Bar	NO OF BARS
III	5/32 3.96	6
IV	3/16 4.76	6

BARS TO BE EQUALLY SPACED AROUND 360°

RUBBER RING

SIZE	INSIDE DIA
In	mm
9/16	14.30
	18.42
	468

STRENGTH REQUIRET/FT. LENGTH

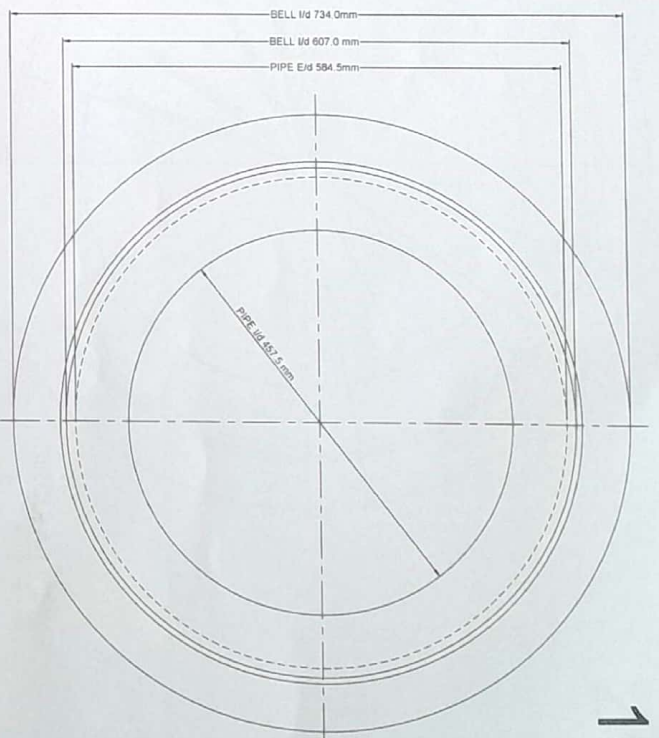
CLASS	WALL	PROOF LOAD	ULTIMATE LOAD	CONCRETE STRENGTH
	Lbs	Tonns	Lbs	Tonns
III	B	1700	0.77	2500
IV	B	2500	1.13	3750

WASA TITLE: CONSTRUCTION DETAIL OF 15" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C78-20

LAHORE

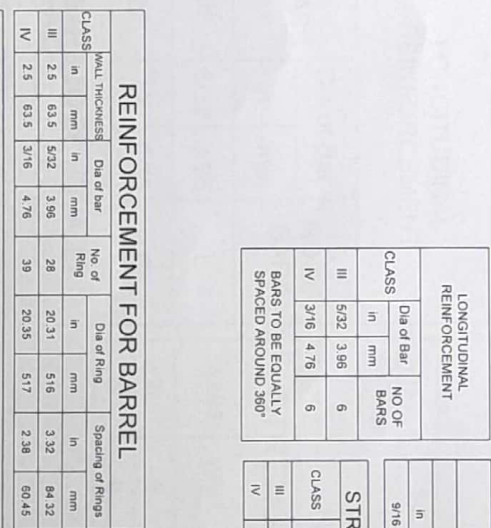
PLANNING & DESIGN DIRECTORATE

DIR. P&D	BY DIR. P&D	DATED: 17.11.2022
AD P&D	SCALE: AS SHOWN	



SCALE: 1cm = 3cm

SCALE: 1cm = 3cm



REINFORCEMENT FOR BARREL

REINFORCEMENT FOR BARREL									
CLASS	WALL THICKNESS		Dia of bar		No of Ring	Dia of Ring		Spacing of Rings	
	in	mm	in	mm		in	mm	in	mm
III	2.5	63.5	5/32	3.96	28	20.31	5.16	3.32	84.32
IV	2.5	63.5	3/16	4.76	38	20.35	5.17	2.58	60.45

REINFORCEMENT FOR BELL

CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	5/16	3.96	2	26.18	665	2	50.8
IV	3/16	4.76	2	26.20	667	2	50.8

 $\bar{z}$

RUBBER RING			
SIZE		INSIDE DIA	
in	mm	in	mm
9/16	14.30	21.73	552

PROOF LOAD	ULTIMATE LOAD	CONF. STR.
------------	---------------	------------

STRENGTH REQUIRET/I. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tons	Lbs	Tons	
III	8	2000	0.92	3000	1.36	4000
IV	8	3000	1.36	4500	2.04	4000

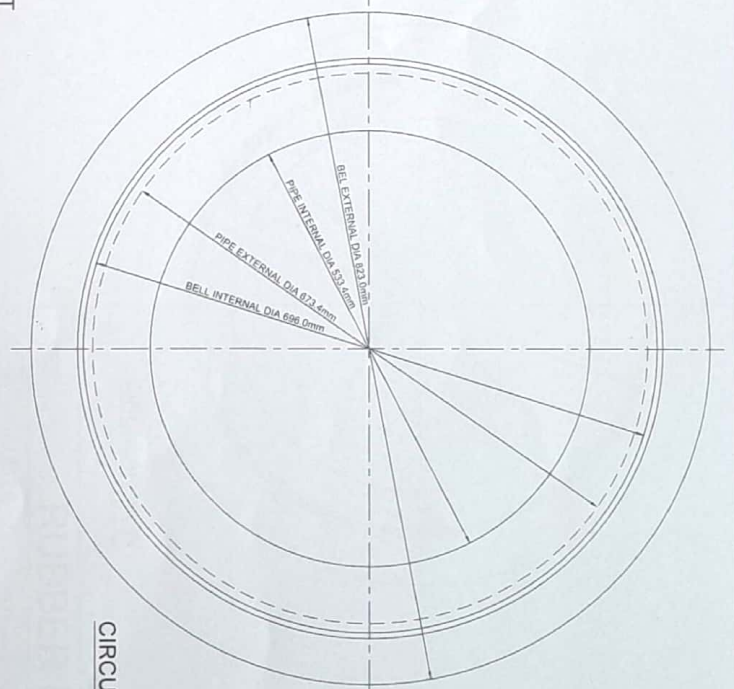
LAHORE

TITLE: CONSTRUCTION DETAIL OF 18" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20

PLANNING & DESIGN DIRECTORATE

DATED: 17.11.2022

SCALE: AS SHOWN



SCALE: 1 cm = 3 cm

SPECIFIC SOCKET & SPIGOT JOINT AND REINFORCEMENT DETAIL

SCALE : 1cm = 3 cm

REINFORCEMENT FOR BARREL									
CLASS	WALL THICKNESS		Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm	in	mm		in	mm	in	mm
III	2.75	69.85	5/32	3.96	29	23.70	602	3.28	83.31
IV	2.75	69.85	1/4	6.35	32	23.85	606	2.97	75.43

REINFORCEMENT FOR BARREL									
CLASS	WALL THICKNESS		Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm	in	mm		in	mm	in	mm
III	2.75	69.85	5/32	3.96	29	23.70	602	3.28	83.31
IV	2.75	69.85	1/4	6.35	32	23.85	606	2.97	75.43

REINFORCEMENT FOR BELL							
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	5/32	3.96	2	30.07	764	2	50.8
IV	1/4	6.35	2	30.27	769	2	50.8

REINFORCEMENT FOR BELL							
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	5/32	3.96	2	30.07	764	2	50.8
IV	1/4	6.35	2	30.27	769	2	50.8

LONGITUDINAL REINFORCEMENT			
CLASS	Dia of Bar		NO OF BARS
	in	mm	
III	5/32	3.96	6
IV	1/4	6.35	6

BARS TO BE EQUALLY
SPACED AROUND 360°

LONGITUDINAL REINFORCEMENT			
CLASS	Dia of Bar		NO OF BARS
	in	mm	
III	5/32	3.96	6
IV	1/4	6.35	6

BARS TO BE EQUALLY
SPACED AROUND 360°

RUBBER RING			
SIZE		INSIDE DIA	
in	mm	in	mm
9/16	14.30	25.07	637

RUBBER RING			
SIZE		INSIDE DIA	
in	mm	in	mm
9/16	14.30	25.07	637

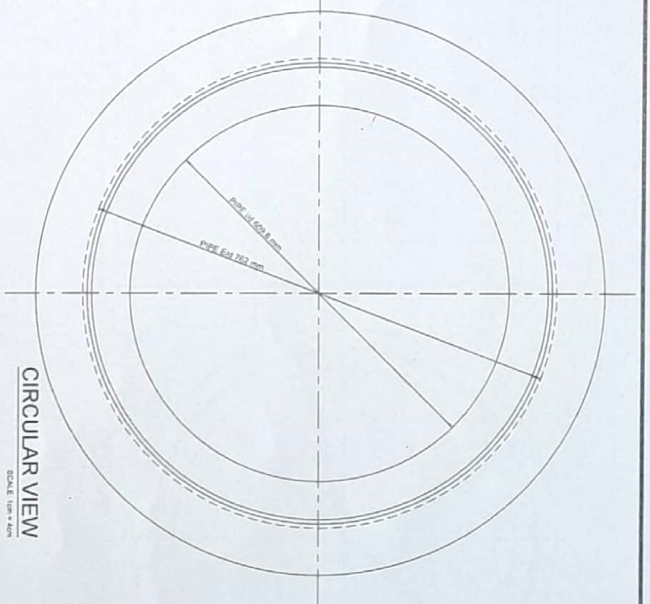
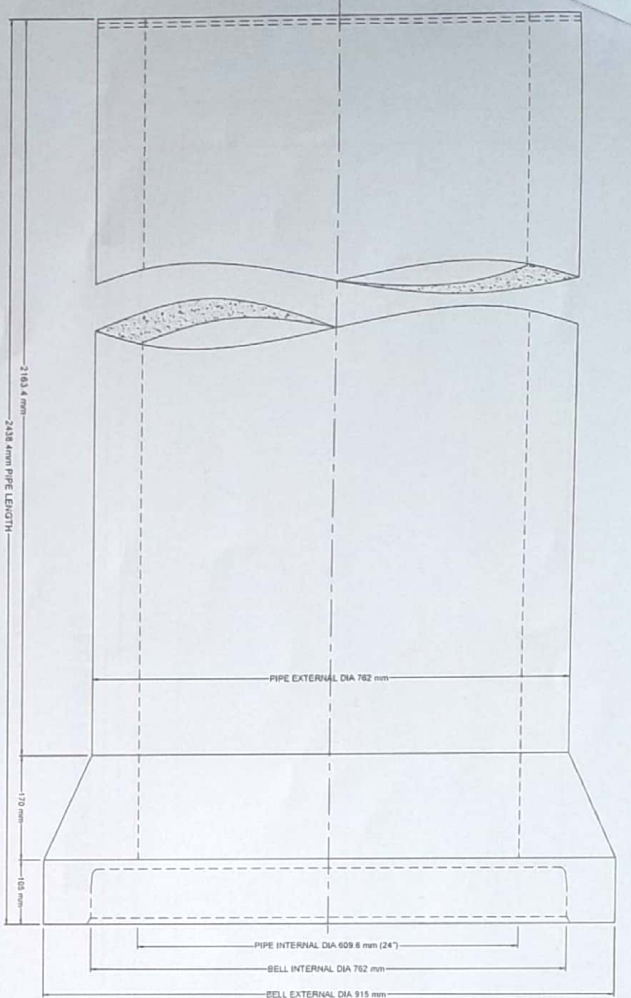
STRENGTH REQUIRET/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tonns	Lbs	Tonns	
III	B	2360	1.07	3510	1.59	4000
IV	B	3510	1.59	5250	2.38	4000

STRENGTH REQUIRET/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tonns	Lbs	Tonns	Psi
III	B	2360	1.07	3510	1.59	4000
IV	B	3510	1.59	5250	2.38	4000

WASA LAHORE	TITLE: CONSTRUCTION DETAIL OF 21" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20
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DATE: 17.11.2022	DY DIR P&D <i>[Signature]</i> DY DIR P&D <i>[Signature]</i>
SCALE: AS SHOWN	DY DIR P&D <i>[Signature]</i> DY DIR P&D <i>[Signature]</i>

24"Ø



LONGITUDINAL REINFORCEMENT			
CLASS	Dia of Bar in mm	NO OF BARS	
III	5/32 3.96	6	
IV	1/4 6.35	6	

BARS TO BE EQUALLY SPACED AROUND 360°

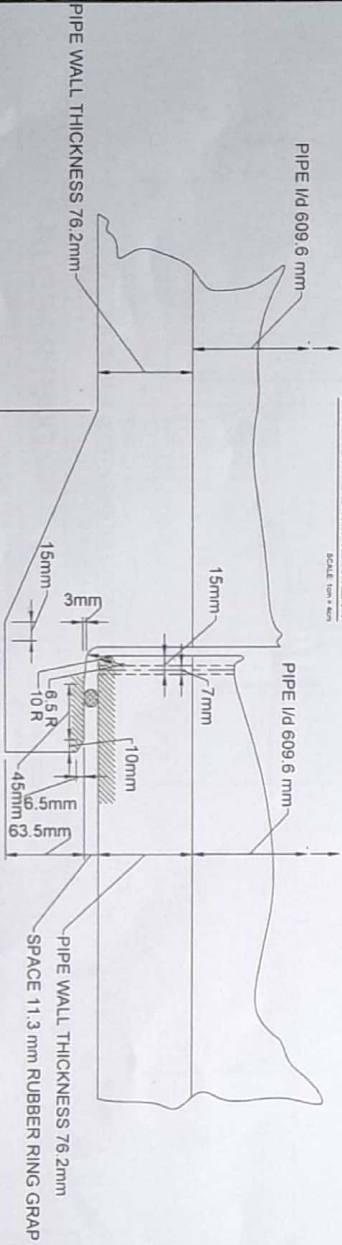
RUBBER RING			
SIZE		INSIDE DIA	
in	mm	in	mm
9/16	14.30	28.38	721

STRENGTH REQUIRET/FT. LENGTH					
CLASS	WALL	PROOF LOAD Lbs	Tonns	ULTIMATE LOAD Lbs	CONCRETE STRENGTH Tonns
III	B	2715	1.23	4015	4000
IV	B	4000	1.81	6000	4000

BELL WALL TH.

PARTIAL SOCKET & SPIGOT JOINT

SCALE: 1/8" = 2mm



REINFORCEMENT FOR BARREL

CLASS	WALL THICKNESS in mm	Dia of bar in mm	No. of Ring	Dia of Ring in mm	Spacing of Rings in mm
III	3	76.2	5/32 3.96	29	26.29 668
IV	3	76.2	1/4 6.35	44	26.45 672

REINFORCEMENT FOR BELL

CLASS	Dia of bar in mm	No. of Ring	Dia of Ring in mm	Spacing of Rings in mm
III	5/32 3.96	2	33.18	843
IV	1/4 6.35	2	33.34	847

WASA TITLE: CONSTRUCTION DETAIL OF 24" INTERNAL DIA R.C.C SEMI PIPE (CLASS-III & IV) AS PER ASTM C76-20

LAHORE

PLANNING & DESIGN DIRECTORATE

DIR P&D

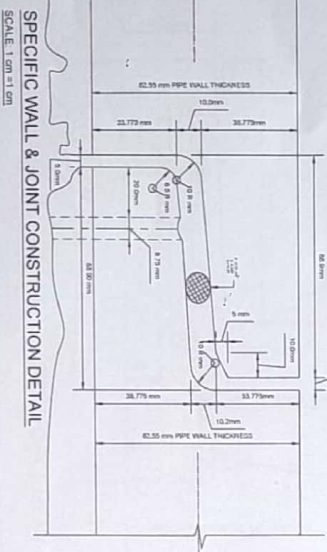
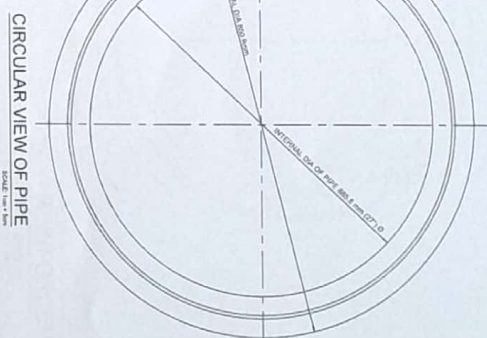
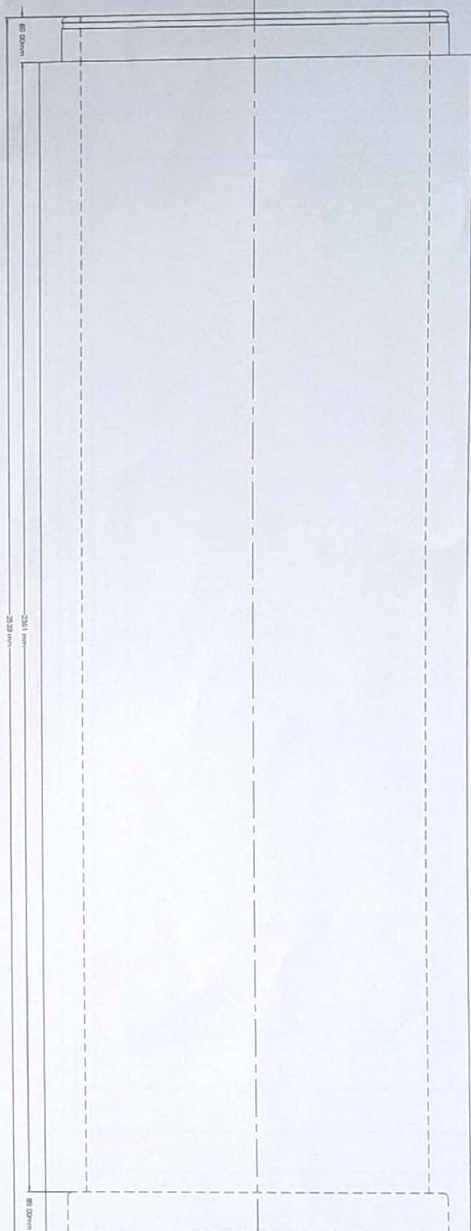
DY DIR P&D

AD P&D

SCALE: AS SHOWN

DATED: 17.11.2022

27"Ø



RUBBER RING

SIZE		INSIDE DIA	
In	mm	In	mm
8/16	14.29	28.08	713

LONGITUDINAL REINFORCEMENT

CLASS	DIA OF BAR	NO OF BARS
III / IV	3/8 9.52	6
III	1/4 6.35	8

STRENGTH REQUIRET/FT. LENGTH

CLASS	WALL	PROOF LOAD	ULTIMATE LOAD	CONCRETE STRENGTH
		Lbs	Tonns	Psi
III	B	3050	1.38	4500
IV	B	4500	2.04	4000

CLASS	WALL THICKNESS	DIA OF BAR	SPACING	NO OF RINGS	DIA OF RING
	In	mm	In	mm	In
III	3.25	82.55	1/4 6.35	94.48	25
IV	3.25	82.55	3/8 9.52	98.29	24

REINFORCEMENT FOR SOCKET

CLASS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
	In	mm	In	mm
III	1/4 6.35	3	32.04	814
IV	3/8 9.52	3	31.81	808

REINFORCEMENT FOR BARREL

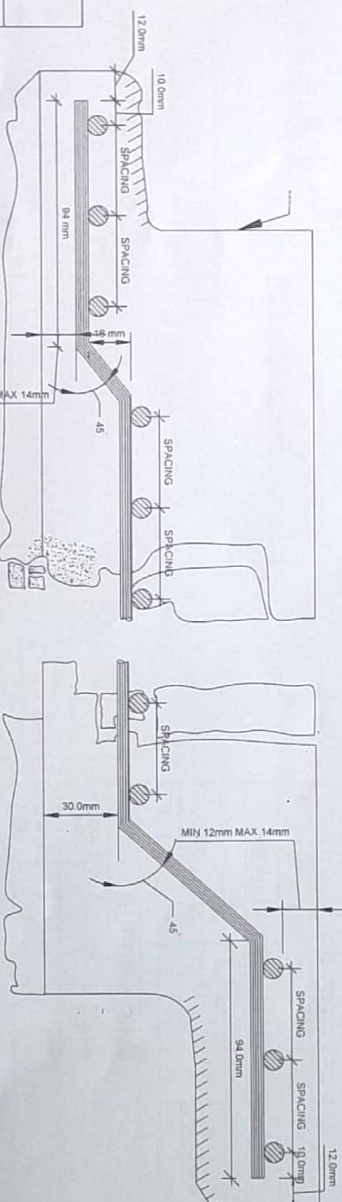
CLASS	WALL THICKNESS	DIA OF BAR	SPACING	NO OF RINGS	DIA OF RING
	In	mm	In	mm	In
III	3.25	82.55	1/4 6.35	94.48	25
IV	3.25	82.55	3/8 9.52	98.29	24

REINFORCEMENT FOR SPIGOT

CLASS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
	In	mm	In	mm
III	1/4 6.35	3	28.46	723
IV	3/8 9.52	3	28.70	729

REINFORCEMENT ARRANGEMENTS

SCALE 1cm = 2cm



WASA TITLE: CONSTRUCTION DETAIL OF 27" INTERNAL DIA R.C.C SEWER PIPE (CLASS III & IV) AS PER ASTM C76-20
LAHORE

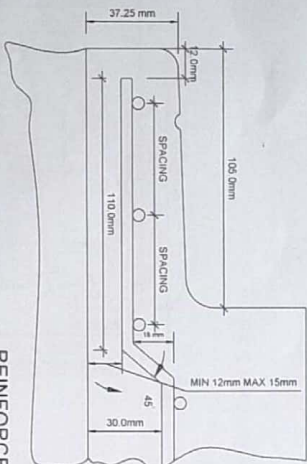
PLANNING & DESIGN DIRECTORATE

DIR P&D	DIR P&D	DATED: 17.11.2022
AD P&D	AD P&D	SCALE: AS SHOWN

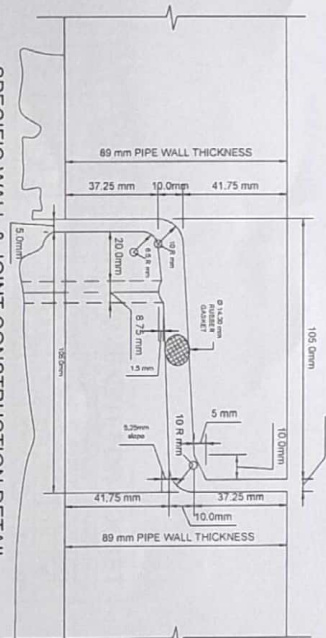
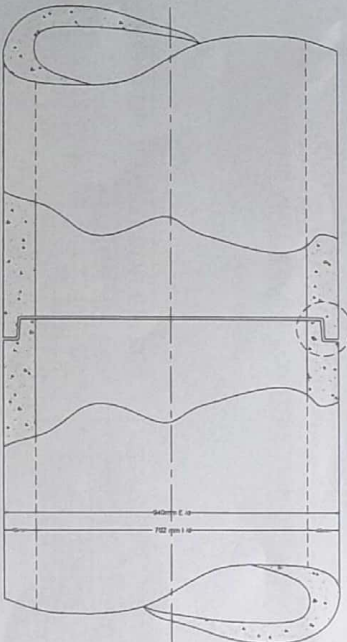
R.C.C PIPE LONGITUDINAL VIEW

CIRCULAR VIEW OF PIPE

30"Ø



REINFORCEMENT ARRANGEMENTS



SPECIFIC WALL & JOINT CONSTRUCTION DETAIL

SCALE

1cm = 1cm

LONGITUDINAL REINFORCEMENT		
CLASS	DIA OF BAR in mm	NO OF BARS
III / IV	3/8 9.52	6
III	1/4 6.35	8

BARS TO BE EQUALLY
SPACED AROUND 360°

RUBBER RING		SIZE		INSIDE DIA	
		In	mm	In	mm
FOR 30" Ø PIPE	9/16	14.33	31.29	795	

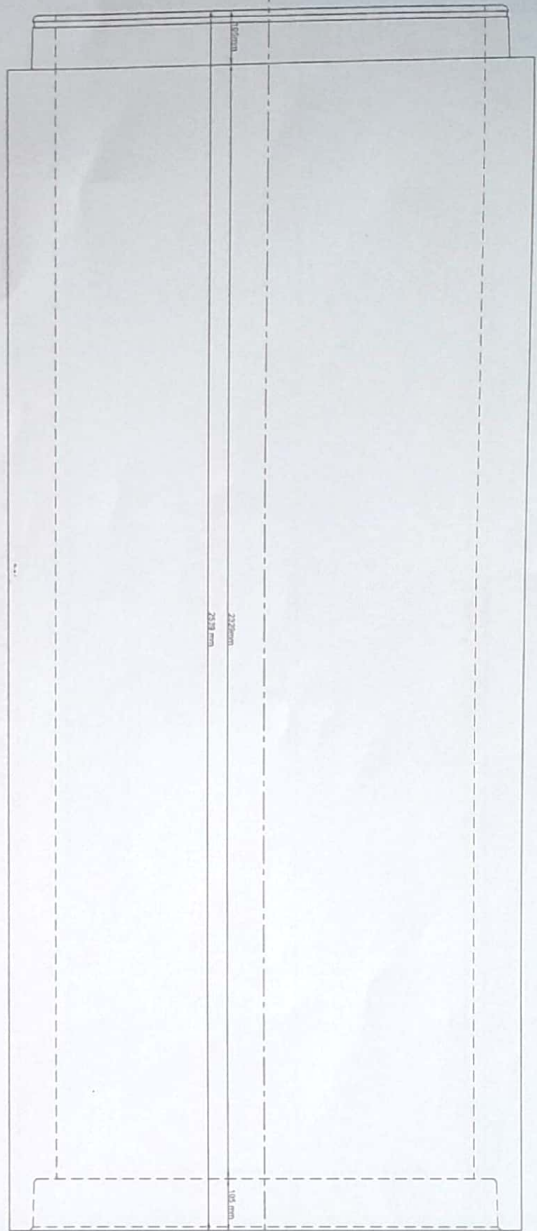
STRENGTH REQUIRE/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tons	Lbs	Tons	
III	B	3375	1.53	5000	2.27	4000
IV	B	5000	2.27	7500	3.4	4000

REINFORCEMENT FOR BARREL									
CLASS	THICKNESS	DIA OF BAR		SPACING	NO OF		DIA OF RING		
		mm	in		mm	in			
III	3	68.9	1/4	6.35	3.27	63.05	28	32.67	63.5
IV	3.5	68.9	3/8	9.52	3.62	97.02	24	32.67	83.5

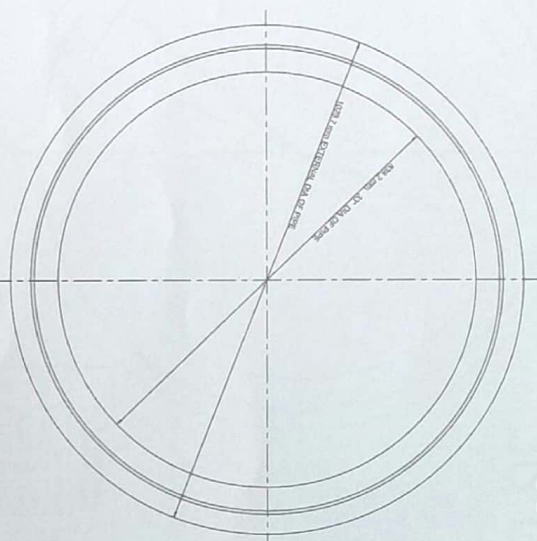
REINFORCEMENT FOR SPIGOT									
CLASS	DIA OF BAR	No. of Ribs	DIA OF THING		SPACING OF RINGS				
			mm	in	mm	in			
III	1/4	6.35	3	31.45	789	1.4	35.55		
IV	3/8	9.52	3	31.45	789	1.4	35.55		

REINFORCEMENT FOR SOCKET							
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	1/4	6.35	3	35.59	904	1.4	35.56
IV	3/8	9.52	3	35.59	904	1.4	35.56

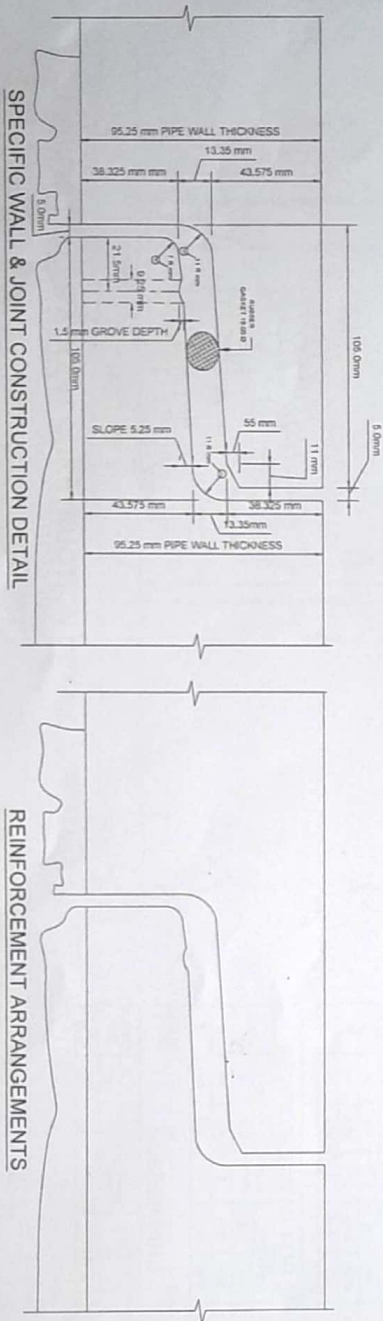
WASA LAHORE	TITLE:	CONSTRUCTION DETAIL OF 30" INTERIOR DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20
	PLANNING & DESIGN DIRECTORATE	
DIR P&D		DY DIR P&D
DY DIR P&D		DATED: 17.11.2022
AD P&D		SCALE: AS SHOWN



R.C.C PIPE LONGITUDINAL VIEW
SCALE: 1mm = 1mm



CIRCULAR VIEW OF PIPE
SCALE: 1mm = 1mm



REINFORCEMENT ARRANGEMENTS

LONGITUDINAL REINFORCEMENT			
CLASS	CODE	DIA OF BAR IN mm	NO OF BARS
III	W8@12	8	7
IV	W10@12	10	6

RUBBER RING			
RUBBER RING	SIZE		INSIDE DIA
	in	mm	mm (3/16")
FOR 33" Ø PIPE			

STRENGTH REQUIREMENT/ LENGTH			
CLASS	WALL	PROOF LOAD	ULTIMATE LOAD
III	B	375	550
IV	B	500	750

REINFORCEMENT FOR SPIGOT

CLASS	Dia of bar	No. of bar	Dia of Ring	Spacing of Rings
III	14	3	24.5	1.4
IV	14	3	24.5	1.4

REINFORCEMENT FOR BARREL

CLASS	Dia of bar	No. of bar	Dia of Ring	Spacing of Rings
III	14	3	24.5	1.4
IV	14	3	24.5	1.4

REINFORCEMENT FOR SOCKET

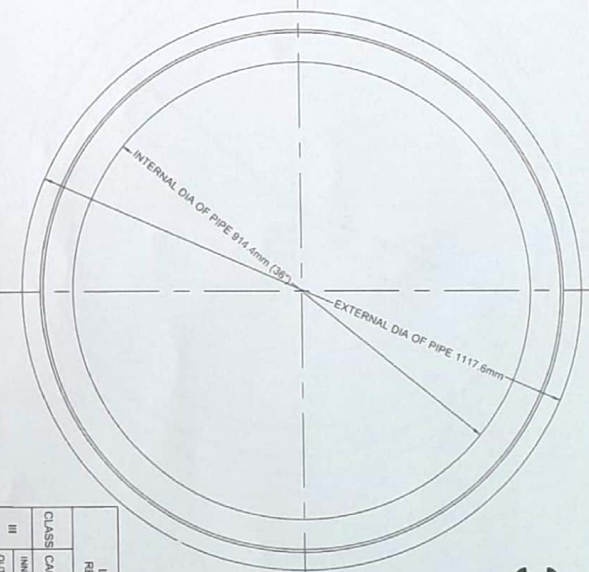
CLASS	Dia of bar	No. of bar	Dia of Ring	Spacing of Rings
III	14	3	24.5	1.4
IV	14	3	24.5	1.4

WASA
LAHORE
TITLE: CONSTRUCTION DETAIL OF 33" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C79-20

PLANNING & DESIGN DIRECTORATE

DIR. P&D
Dated: 17.11.2022

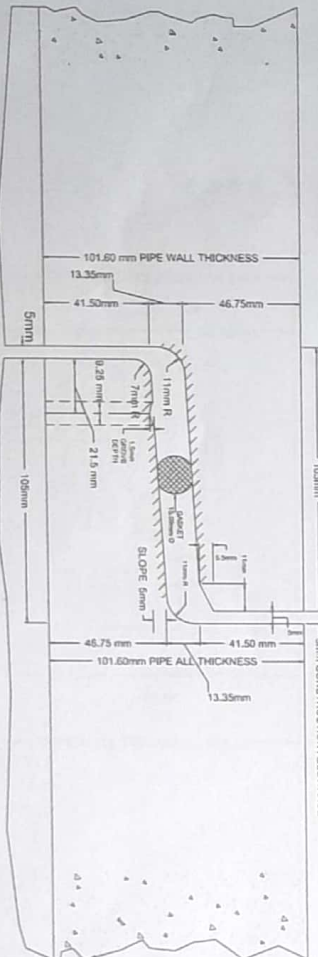
AD P&D
SCALE: AS SHOWN



36" Ø

R.C.C PIPE LONGITUDINAL VIEW

SCALE : 1 cm = 5 cm



REINFORCEMENT FOR SOCKET

CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	In	mm		In	mm	In	mm
III	3/16	4.76	3	42.36	1070	1.38	35.05
IV	1/4	6.35	3	42.30	1076 ₊	1.36	35.05

REINFORCEMENT FOR SPIGOT

REINFORCEMENT FOR SPIGOT							
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	1/4	6.35	3	37.03	954	1.38	35.05
IV	1/4	6.35	3	37.03	956	1.38	35.05

RUBBER RING

RUBBER RING			
RUBBER RING For 36" D Pipe	S I Z E		INSIDE DIA. METER
	in	mm	in
	3 1/16	15.09	37.20
			945

REINFORCEMENT FOR BARREL

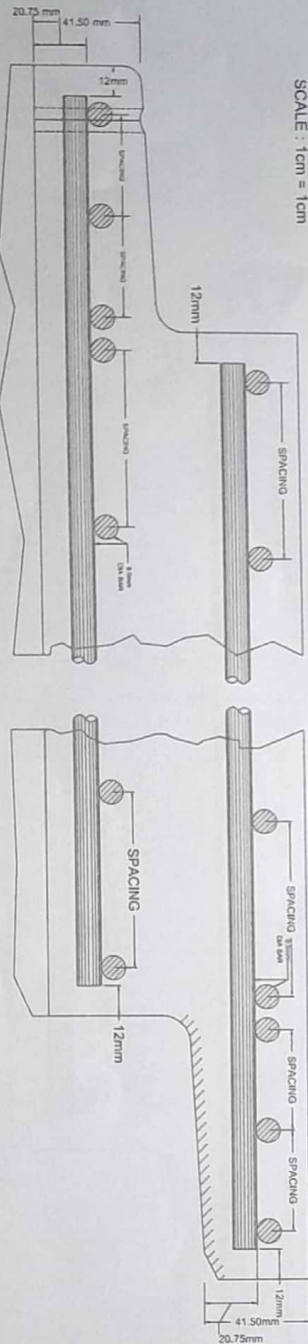
REINFORCEMENT FOR BARREL								
CLASS	BARREL THICKNESS	WALL THICKNESS	DL OF BART	SPACING	NO OF RINGS	DL OF RING		
	in	mm	in	mm				
III	INNER	4 1/16	1.94	3.51	88.66	26	37.63	956
	OUTER	4 1/16	3.06	4.78	3.27	89.05	28	42.36
IV	INNER	4 1/16	1.8	3.51	101.24	23	47.53	1076
	OUTER	4 1/16	1.4	3.05	3.27	83.06	28	42.36

STRENGTH REQUIRE'T/FT. LENGTH

STRENGTH REQUIRET/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tons	Lbs	Tons	
III	B	4060	1.84	6000	2.72	4000
IV	B	6000	2.72	9000	4.08	4000

SPECIFIC WALLS & JOINT CONSTRUCTION DETAIL

SCALE : 1cm = 1cm



REINFORCEMENT ARRANGEMENT

SCALE : 1cm = 1cm

WASA LAHORE	TITLE: CONSTRUCTION DETAIL OF 36" INTERNAL DIAR C.C. SEMVER PIPE (CLASS-III & IV) AS PER ASTM C76-20
	PLANNING & DESIGN DIRECTORATE
DIR P&D <i>[Signature]</i>	DY DIR P&D <i>[Signature]</i>
DY DIR P&D <i>[Signature]</i>	AD P&D <i>[Signature]</i>
DATED: 17.11.2022	SCALE: AS SHOWN

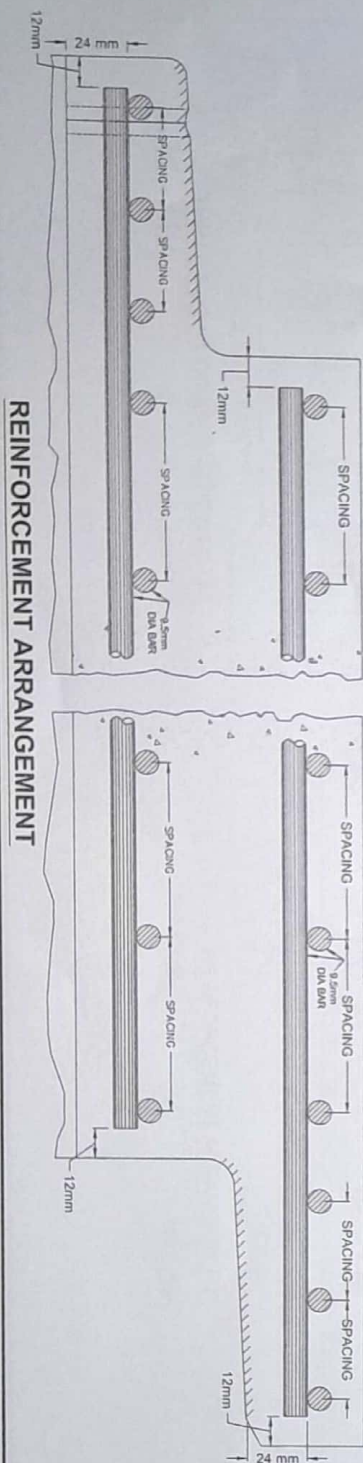
Diagram illustrating the dimensions of a pipe cross-section:

- INTERNAL DIA OF PIPE 1268.8 mm (4'1")
- EXTERNAL DIA OF PIPE 1295.6mm

Technical drawing of a pipe end view showing dimensions for a gasket and construction allowance. The drawing includes the following dimensions and labels:

- PIPE WALL THICKNESS 114.3 mm** (top and bottom labels)
- 15.55 mm** (dimension for the gasket area)
- 46.60 mm** (dimension for the gasket area)
- 52.15 mm** (dimension for the gasket area)
- 11 mm R** (radius dimension for the gasket area)
- GASKET DIA 19.05 mm** (dimension for the gasket diameter)
- 7 mm R** (radius dimension for the gasket area)
- 25 mm** (dimension for the gasket area)
- 10.75 mm** (dimension for the gasket area)
- 1.5 mm** (dimension for the gasket area)
- GROOVE DEPTH** (label for the groove depth)
- SLOPE 5.5 mm** (dimension for the slope)
- 5.0 mm** (dimension for the gasket area)
- 1 mm R** (radius dimension for the gasket area)
- 52.15 mm** (dimension for the gasket area)
- 46.60 mm** (dimension for the gasket area)
- 15.55 mm** (dimension for the gasket area)
- PIPE WALL THICKNESS 114.3 mm** (bottom label)
- CONSTRUCTION ALLOWANCE** (label for the construction allowance)
- 5 mm** (dimension for the construction allowance)

SPECIFIC WALLS & JOINT CONSTRUCTION DETAIL



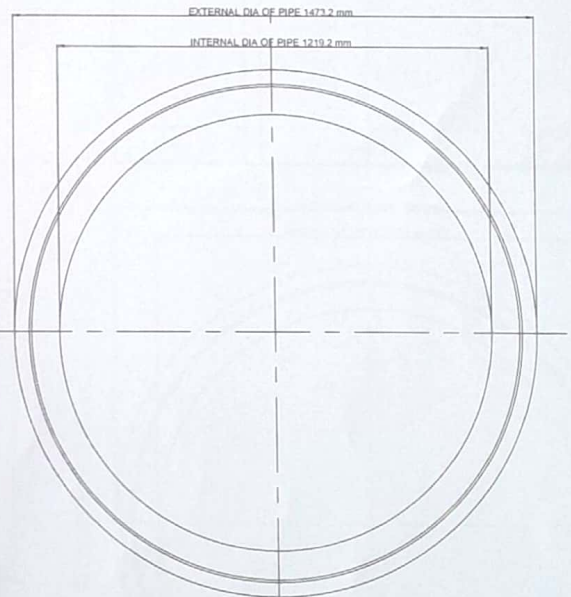
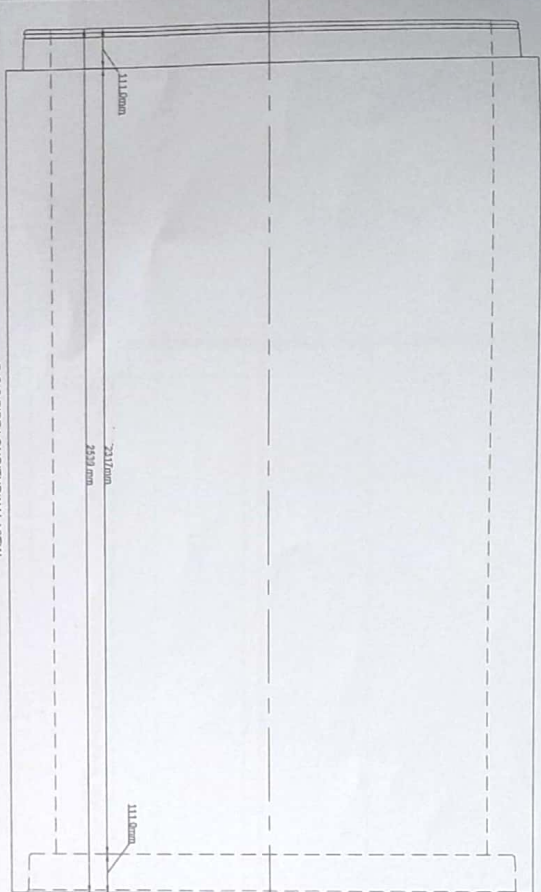
RUBBER RING				
RUBBER RING For 42" Ø Pipe	S I Z E		INSIDE DIA METER	
	In	mm	In	mm
3/4	19.05	43.26	1099	

REINFORCEMENT FOR SOCKET						
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings
	In	mm		In	mm	
III	1/4	6.35	3	49.13	1246	1.46
IV	1/4	6.35	3	49.13	1246	1.46
						37.08

REINFORCEMENT FOR SPIGOT							
CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	In	mm		In	mm	In	mm
III	1/4	6.35	3	43.69	1115	1.46	37.08
IV	1/4	6.35	3	43.69	1115	1.46	37.08

DIR P&D		DATED: 17.11.2022
DY DIR P&D		SCALE: AS SHOWN

48"Ø



LONGITUDINAL REINFORCEMENT			
CLASS	CAGE	DIA OF BAR	NO OF BARS
III	INNER	3/8 9.52	8
III	OUTER	3/8 9.52	8
IV	INNER	1/2 12.7	8
IV	OUTER	1/2 12.7	8

BARS TO BE EQUALLY SPACED AROUND 360

RUBBER RING			
RUBBER RING	SIZE	INSIDE DIA	
FOR 48" Ø PIPE	3/4	19.05	49.44
			1255

REINFORCEMENT FOR SPIGOT			
CLASS	Dia of bar	No. of Ring	Spacing of Rings
III	1/4 6.35	3	50.07 127.2 1.46 37.08
IV	3/8 9.52	3	50.07 127.2 1.46 37.08

REINFORCEMENT FOR SOCKET			
CLASS	Dia of bar	No. of Ring	Spacing of Rings
III	1/4 6.35	3	55.90 1420 1.46 37.08
IV	3/8 9.52	3	55.90 1420 1.46 37.08

STRENGTH REQUIRET/FT. LENGTH			
CLASS	WALL	PROOF LOAD	CONCRETE STRENGTH
III	B	5400	2.45
IV	B	8000	3.63

REINFORCEMENT FOR BARREL			
CLASS	THICKNESS	DIA OF BAR	SPACING
III	INNER	5 127	1/4 6.35
III	OUTER	5 127	1/4 6.35
IV	INNER	5 127	3/8 9.52
IV	OUTER	5 127	3/8 9.52

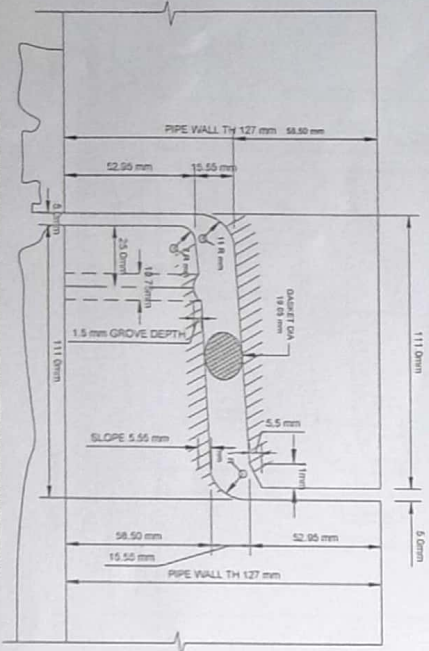
WASA TITLE: CONSTRUCTION DETAIL OF 48" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20
LAHORE

PLANNING & DESIGN DIRECTORATE

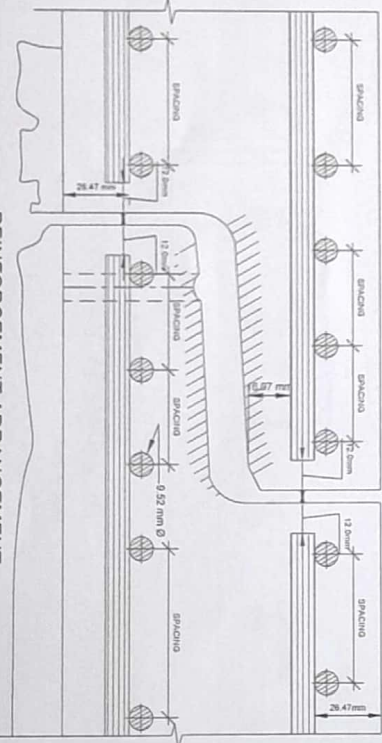
DIR. P&D BY: *[Signature]* DATED: 17.11.2022

BY: *[Signature]* AD P&D SCALE: AS SHOWN

SPECIFIC WALL & JOINT CONSTRUCTION DETAIL
scale 1cm = 1cm



REINFORCEMENT ARRANGEMENT
scale 1cm = 1cm



This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and extend across the width of the page. There are also vertical margin lines on the left and right sides, creating narrow margins. The paper appears to be from a binder or folder, as there's a slight shadow at the top edge.

EXTERNAL DIA OF PIPE 1651.0mm

INTERNAL DIA OF PIPE 1371.8 mm (54")

The diagram shows a cross-section of a pipe with two concentric circles. The outer circle represents the external diameter, and the inner circle represents the internal diameter. A vertical dashed line and a horizontal dashed line intersect at the center of the circles. The text 'EXTERNAL DIA OF PIPE 1651.0mm' is positioned above the top circle, and 'INTERNAL DIA OF PIPE 1371.8 mm (54")' is positioned above the bottom circle.

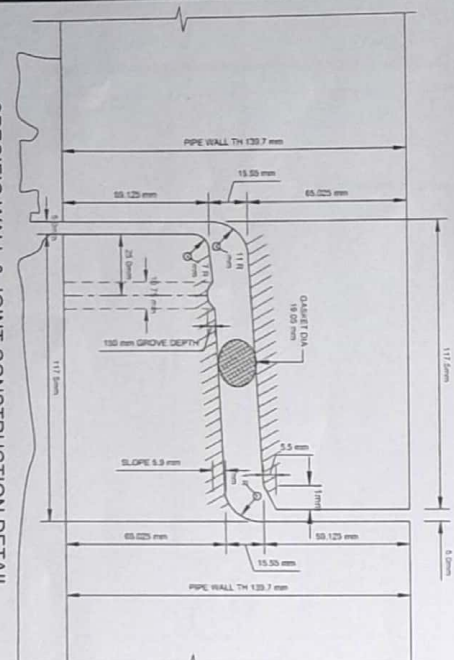
CIRCULAR VIEW OF PIPE

LONGITUDINAL REINFORCEMENT				
CLASS	CAGE	DIA OF BAR		NO OF BARS
		in	mm	
III	INNER	3/8	9.52	8
	OUTER	3/8	9.52	8
IV	INNER	1/2	12.7	8
	OUTER	1/2	12.7	8

BARS TO BE EQUALLY
SPACED AROUND 360

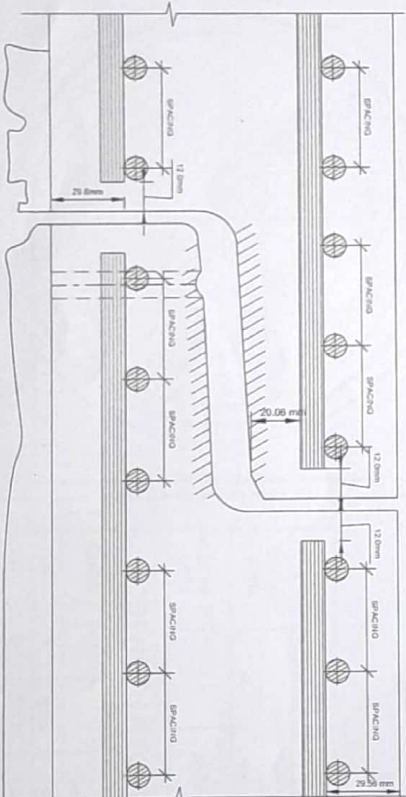
RUBBER RING				
RUBBER RING	SIZE		INSIDE DIA	
	IN	MM	IN	MM
FOR 54" Ø PIPE	3/4	19.05	55.62	1413

STRENGTH REQUIRE T/T. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH PSI
		Lbs	Tonns	Lbs	Tonns	
III	B	6085	2.76	9020	4.09	4000
IV	B	9000	4.08	13500	6.12	4000



SPECIFIC WALL & JOINT CONSTRUCTION DETAIL

scale



REINFORCEMENT ARRANGEMENT

scale

REINFORCEMENT FOR SOCKET

CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	in	mm		in	mm	in	mm
III	1/4	0.35	3	02.07	1502	1.54	30.11
IV	3/8	0.52	3	02.07	1502	1.54	30.11

REINFORCEMENT FOR BARREL

CLASS	NUMBER OF TESTS	DIA OF BAR			SPACING		NO OF RINGS	DIA OF RING		
		in	mm	in	mm	in		mm		
III	INNER	5.5	130.7	1/4	0.35	2.02	51.3	45	56.33	1431
	OUTER	5.5	130.7	1/4	0.35	3.40	86.64	19	62.67	1592
	AVERAGE	5.5	130.7	1/2	1.27	4.77	121.15	20	56.33	1431
IV	INNER	4.5	113.0	3/8	0.52	4.4	109.73	21	62.67	1592
	OUTER	4.5	113.0	3/8	0.52	4.4	109.73	21	62.67	1592
	AVERAGE	4.5	113.0	3/8	0.52	4.4	109.73	21	62.67	1592

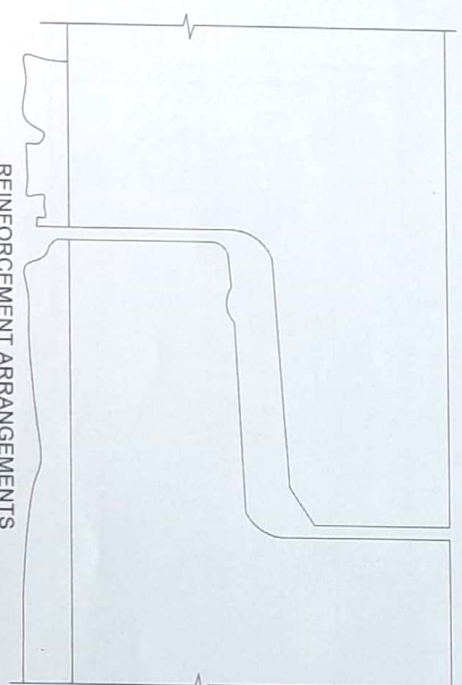
REINFORCEMENT FOR SPIGOT

CLASS	Dia of bar	No. of Rings	Spacing of Rings			
			in		mm	
III	1/4	3	50.33	1431	1.54	39.11
IV	3/8	3	50.33	1431	1.54	39.11

WASA LAHORE	TITLE: CONSTRUCTION DETAIL OF 54" INTERNAL DIA R.C C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20
	PLANNING & DESIGN DIRECTORATE
DIR P&D 	DY DIR P&D 
DY AD P&D 	DATED: 17.11.2022 SCALE: AS SHOWN

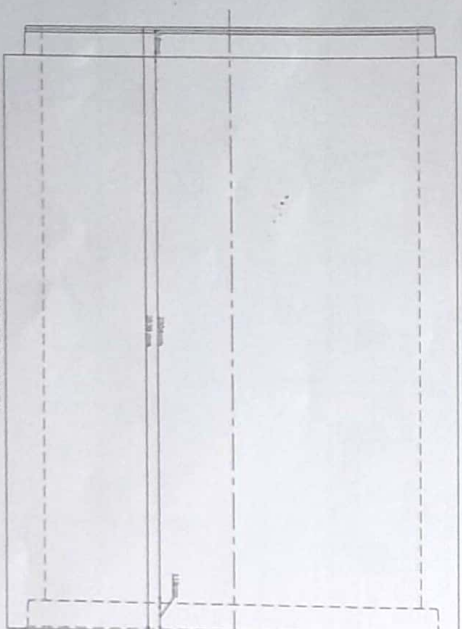
scale

1cm = 1cm

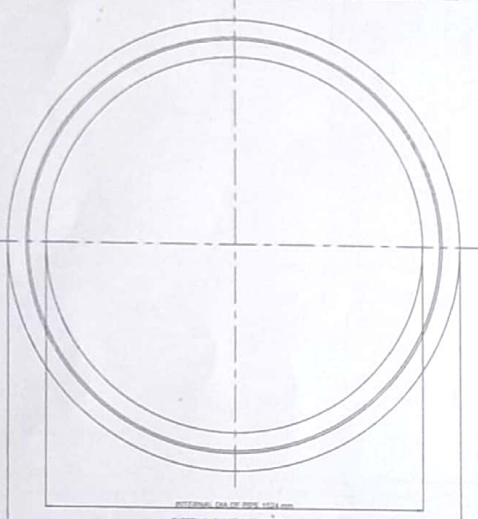


scale

1cm = 1cm



R.C. GRIFFITHS/COMPTONIA, YREKA



CIRCULAR VIEW OF PAPER

RUBBER RING				
RUBBER RING	SIZE		INSIDE DIA	
	in	mm	in	mm
FOR 60" Ø PIPE	7/8	22.22	6.169	156.7

LONGITUDINAL REINFORCEMENT			
CLASS	CAGE	DIA OF BAR in mm	NO OF BARS
III	INNER	3/8	8
	OUTER	3/8	9
IV	INNER	1/2	8
	OUTER	1/2	8

STRENGTH REQUIRET/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tons	Lbs	Tons	
III	B	6750	3.06	10010	4.54	4000
IV	B	10010	4.54	15015	6.81	5000

CLASS	Length (inches)		NO. OF RING	Length (inches)	
	in	mm		in	mm

	1971	1972	1973	1974	1975	1976	1977
III	1/4	0.35	3	60.40	1765	1.54	20.11
IV	3/0	0.52	3	60.40	1765	1.54	20.11

REACTANT	THIOESTER		ESTER		NO OF RINGS	NO OF CARBONS	
	in	mm	in	mm		in	mm
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1
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25	1	1	1	1	1	1	1
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27	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1
31	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1
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36	1	1	1	1	1	1	1
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38	1	1	1	1	1	1	1
39	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1
41	1	1	1	1	1	1	1
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51	1	1	1	1	1	1	1
52	1	1	1	1	1	1	1
53	1	1	1	1	1	1	1
54	1	1	1	1	1	1	1
55	1	1	1	1	1	1	1
56	1	1	1	1	1	1	1
57	1	1	1	1	1	1	1
58	1	1	1	1	1	1	1
59	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1
61	1	1	1	1	1	1	1
62	1	1	1	1	1	1	1

	INDEX	6	152.2	3.0	9.42	3.94	100.07	23	62.51	1588
III	OUTER	6	152.4	1.4	6.35	2.93	74.42	31	69.48	1765
	INDEX	6	152.4	1.2	12.7	3.94	100.07	23	62.51	1588
IV	OUTER	6	152.2	3.0	9.42	3.70	99.01	24	69.48	1765

CLASS	in		mm	in	mm
	in	mm			
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III	1/4	6.35	3	62.51	1588	1.54	39.11
IV	3/8	9.52	3	62.51	1588	1.54	39.11

SIZE	IN
------	----

RING	in	mm	in	mm
FOR 60" Ø PIPE	7/8	22.22	61.69	1567

CLASS	WALL	PROOF LOAD			ULTIMATE LOAD		
		STR	STR	STR	STR	STR	STR

CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH PSI
		Lbs	Tonns	Lbs	Tonns	
III	B	8750	3.06	10010	4.54	4000
IV	B	10010	4.54	15015	6.81	5000

LAHORE

LAHORE

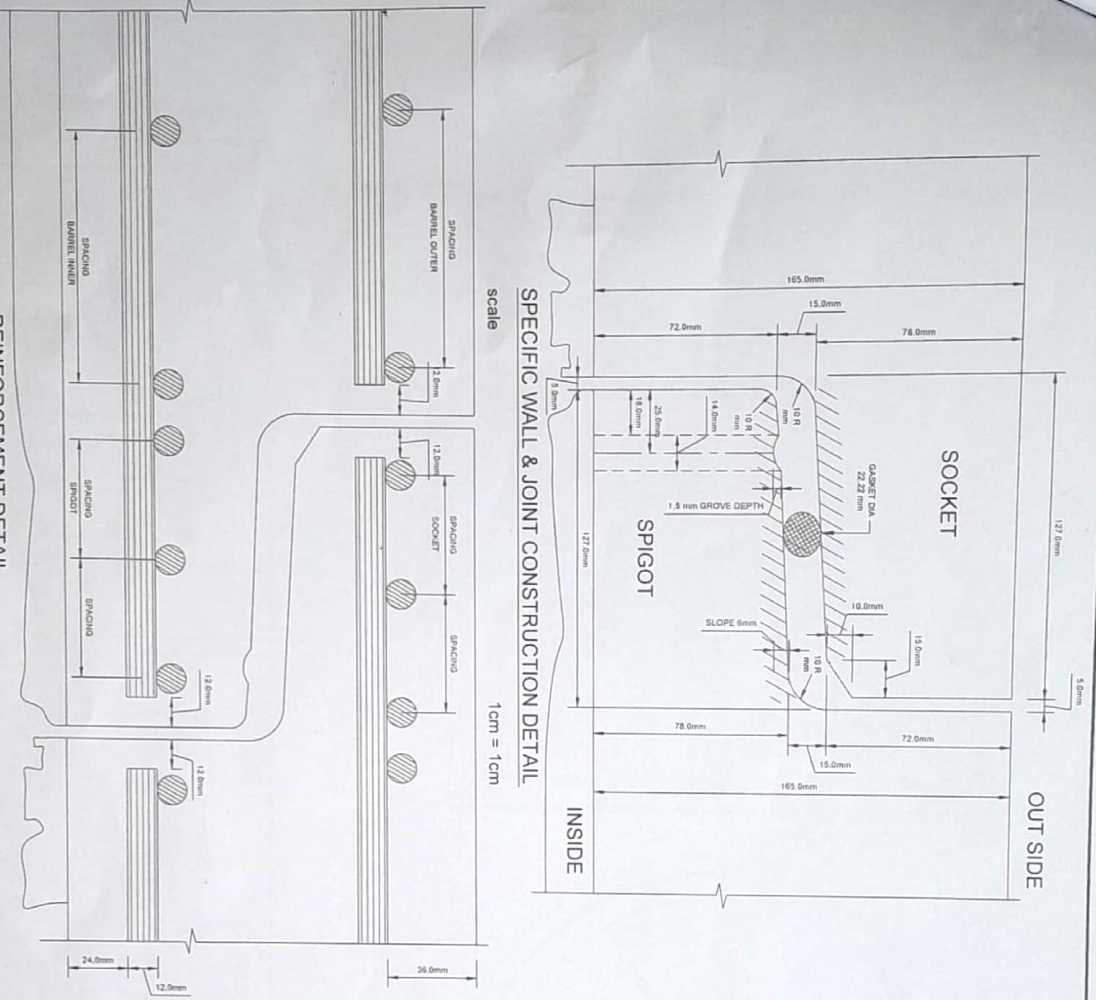
TITLE: CONSTRUCTION DETAIL OF 60" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20C

PLANNING & DESIGN DIRECTORATE

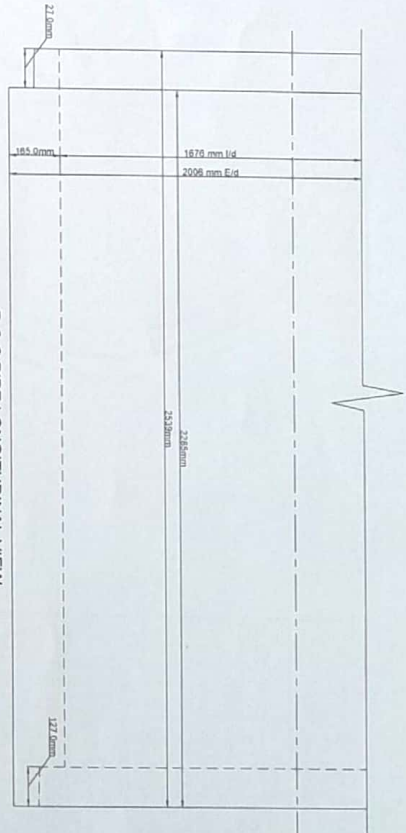
DIR P&D		
DY DIR, P&D		
DATED:	17.11.2022	

 DR J. L. SMITH	 AD P&D	SCALE: AS SHOWN
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SPECIFIC WALL & JOINT CONSTRUCTION DETAIL
scale 1cm = 1cm



R.C.C PIPE LONGITUDINAL VIEW
SCALE 1cm = 10cm



66"Ø

REINFORCEMENT FOR SOCKET

CLASS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
III	1/4	3	76.14	1934
IV	1/2	3	76.14	1934

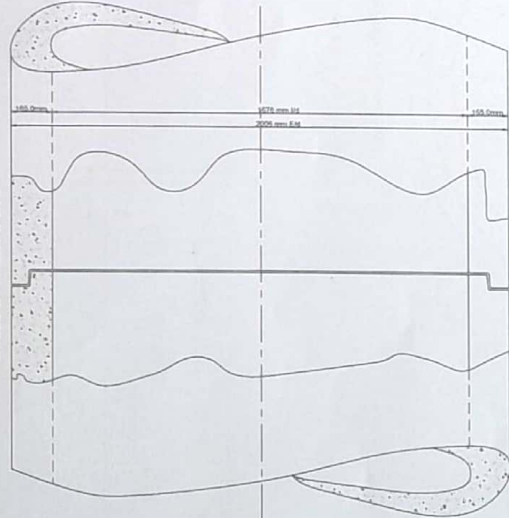
REINFORCEMENT FOR BARREL

CLASS	THICKNESS	DIA OF BAR	SPACING	NO OF RINGS	DIA OF RING
III	6.5	165.1	3.08	9.52	3.21
IV	6.5	165.1	3.08	9.52	5.62

REINFORCEMENT FOR SPIGOT

CLASS	Dia of bar	No. of Ring	Dia of Ring	Spacing of Rings
III	1/4	3	68.81	1748
IV	1/2	3	68.81	1748

TWO PIPES JOINT DETAIL



RUBBER RING

RUBBER RING	SIZE	INSIDE DIA
FOR 66" Ø PIPE	7/8	22.22

STRENGTH REQUIRE/FT. LENGTH

CLASS	WALL	PROOF LOAD	ULTIMATE LOAD	CONCRETE STRENGTH
III	B	7430	3.37	11000
IV	B	11000	4.99	16515

WASA

LAHORE

PLANNING & DESIGN DIRECTORATE

TITLE: CONSTRUCTION DETAIL OF 66" INTERNAL DIA R.C.C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20

DIR. P&D

DATED: 17.11.2022

DY. DESIGNER

AD. P&D

SCALE: AS SHOWN

CIRCULAR VIEW OF PIPE
SCALE: 1 cm = 10 mm

LONGITUDINAL REINFORCEMENT		
CLASS	DIA OF BAR CAGE	NO OF BARS
III	INNER 3/8	8
	OUTER 3/8	8
IV	INNER 1/2	8
	OUTER 1/2	8

BARS TO BE EQUALLY
 SPACED AROUND 360°

BARS TO BE EQUALLY
SPACED AROUND 360

CLASS	REINFORCING	WALL THICKNESS	DIA OF BAR		SPACING	NO OF RINGS	DIA OF RING	
			in	mm			in	mm
III	INNER	7 1/17	3/8	9.52	2.75	63.34	3.5	75
	OUTER	7 1/17	3/8	9.52	4.51	114.45	20	83.25
IV	INNER	7 1/17	1/2	12.7	3.01	78.45	30	83.25
	OUTER	7 1/17	1/2	12.7	5.01	127.35	19	83.03

REINFORCEMENT FOR BARREL

CLASS	Dia of Bar		No. of Ring	Dia of Ring		Spacing of Rings	
	In	mm		In	mm	In	mm
III	3/8	0.52	3	83.03	2.109	1.63	41.40
IV	1/2	12.7	3	83.03	2.109	1.63	41.40

REINFORCEMENT FOR SOCKET

CLASS	Dia of bar		No. of Ring	Dia of Ring		Spacing of Rings	
	In	mm		In	mm	In	mm
III	3/8	9.52	3	7/5	1805	1.53	41.40
IV	1/2	12.7	3	7/5	1905	1.53	41.40

REINFORCEMENT FOR SPIGOT

STRENGTH REQUIRET/FT. LENGTH						
CLASS	WALL	PROOF LOAD		ULTIMATE LOAD		CONCRETE STRENGTH
		Lbs	Tons	Lbs	Tons	
III	B	8115	3.69	12015	5.45	4000
IV	B	12000	5.44	18010	8.17	5000

STRENGTH REQUIRET/FT. LENGTH

RUBBER RING				
RUBBER RING	SIZE		INSIDE DIA	
	in	mm	in	mm
FOR 72" Ø PIPE	1 1/2	28.57	73.93	1879

RUBBER RING

TITLE: CONSTRUCTION DETAIL OF 72" INTERNAL DIA R.C C SEWER PIPE (CLASS-III & IV) AS PER ASTM C76-20

PLANNING & DESIGN DIRECTORATE

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