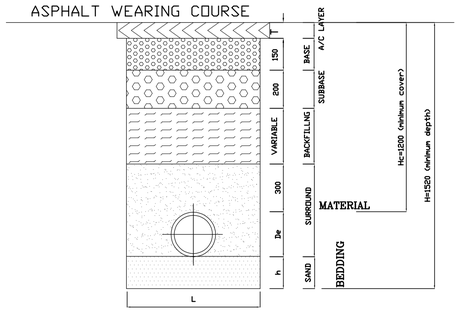
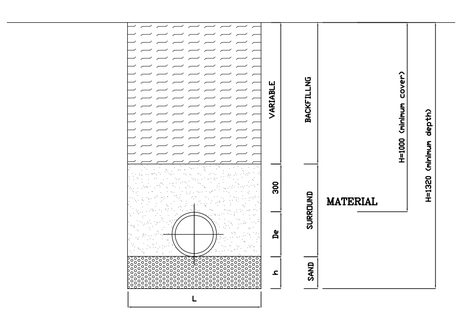
TYPE –I– ABOVE WATER TABLE
CROSS SECTION



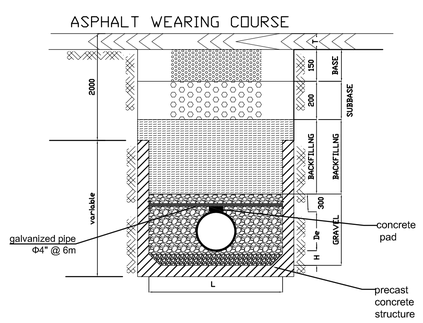
h min = (1/10)De+100mm (SEE NOTE)
L min = (4/3)De+450mm (SEE NOTE)
* THE SURROUND MATERIAL IS AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS

TRENCH IN NATURAL TERRAIN
CROSS SECTION



TRENCH IN NATURAL TERRAIN

TYPE –II– BELOW WATER TABLE
CROSS SECTION

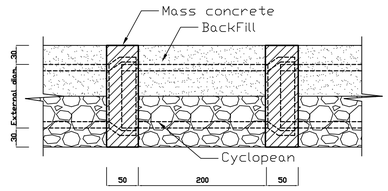


H min = 200mm (SEE NOTE)
L = REFER TO CONCRETE STRUCTURE DETAIL
* THE SURROUND MATERIAL IS AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS

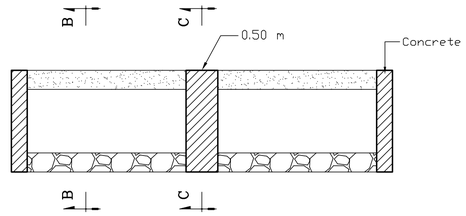
FOR PRECAST CONCRETE STRUCTURE REFER TO NOTE

CONCRETE SURROUND IN WATER COURSES

PIPE SECTION DETAILS

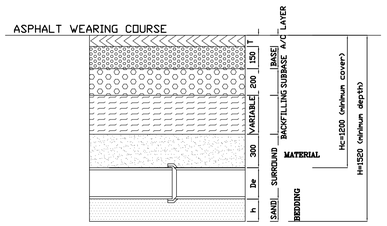


TOP VIEW
SCALE:1:50

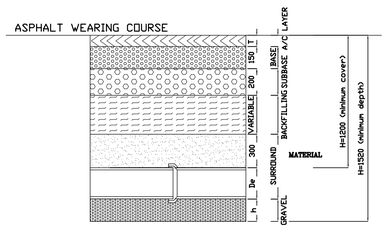


SECTION A–A
SCALE:1:50

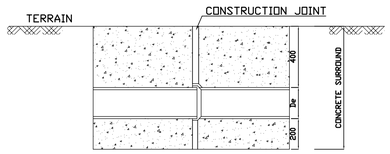
LONGITUDINAL SECTION

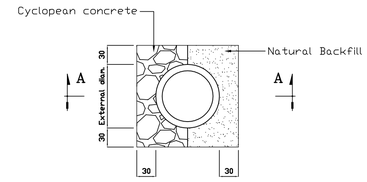


LONGITUDINAL SECTION



LONGITUDINAL SECTION

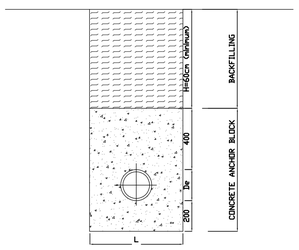




CROSS SECTION B–B
SCALE:1:50

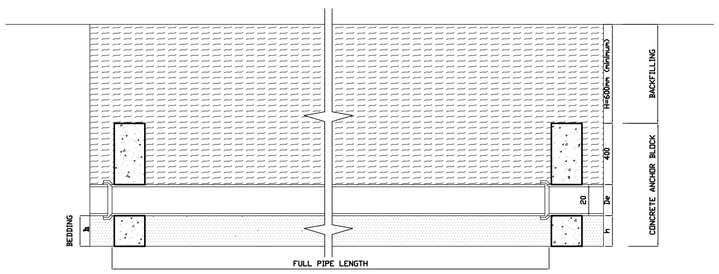
TRENCH IN NATURAL TERRAIN
LAID ON SLOPES > 25%

CROSS SECTION



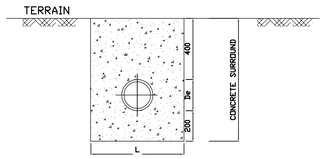
L min = (4/3)De+450mm (SEE NOTE)

LONGITUDINAL SECTION

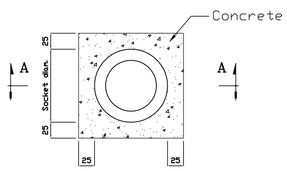


h min = (1/10)De+100mm (SEE NOTE)

TRENCH IN NATURAL TERRAIN
NEAR OR ACROSS A WATER COURSE
CROSS SECTION



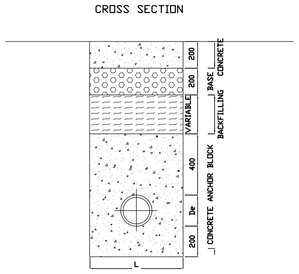
L min = De+400mm (SEE NOTE)



CROSS SECTION C–C
SCALE:1:50

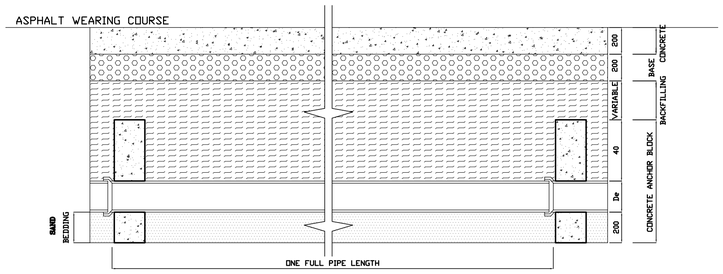
TRENCH IN PAVED ROADS
LAID ON SLOPES > 25%

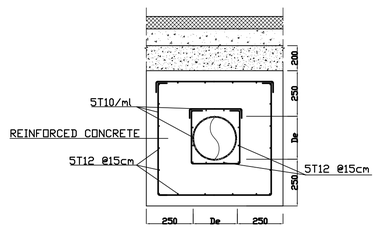
CROSS SECTION



L min = (4/3)De+450mm (SEE NOTE)

LONGITUDINAL SECTION





IN ROAD TRENCH SHALLOW DEPTH

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS
- IN CASE OF BURRIED CHANNEL "De" IN ALL FORMULAS WILL BE REPLACED BY THE CHANNEL WIDTH.
- ASPHALT WIDTH (REFER TO PARTICULAR SPECIFICATIONS)

T (mm)	ROAD TYPES
50 mm	INTERNAL ROADS
90 mm	MAIN ROADS

- FOR THE PRECAST CONCRETE STRUCTURE BELOW WATERTABLE, REFER TO DRAWINGS
NB: 451W–STDP09, 451W–STDP10 AND 451W–STDP11

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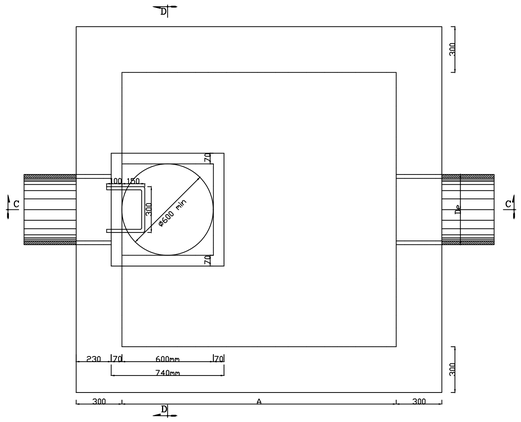
EL MINA REMAINING COASTAL SEWER COLLECTORS

STANDARD DRAWING	PIPE TRENCH DETAILS GENERAL DETAILS

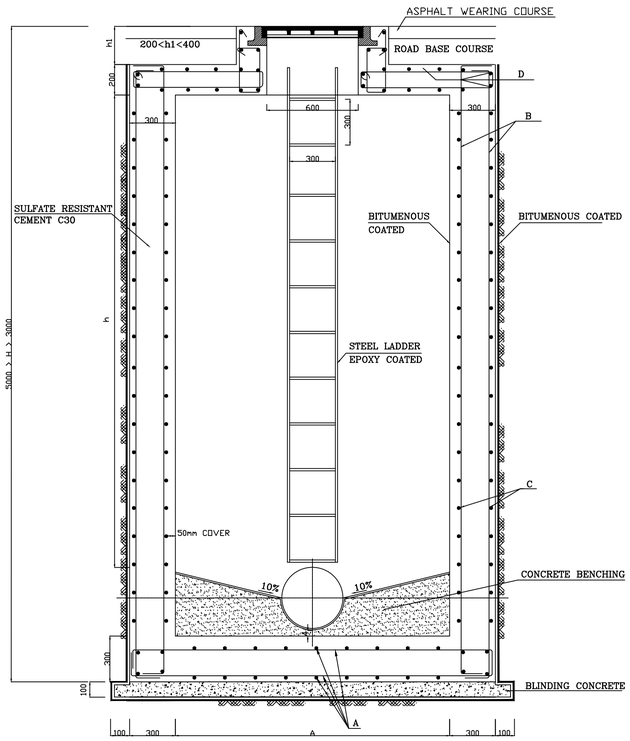
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP01	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	AS SHOWN	1/11	451W–STDP01

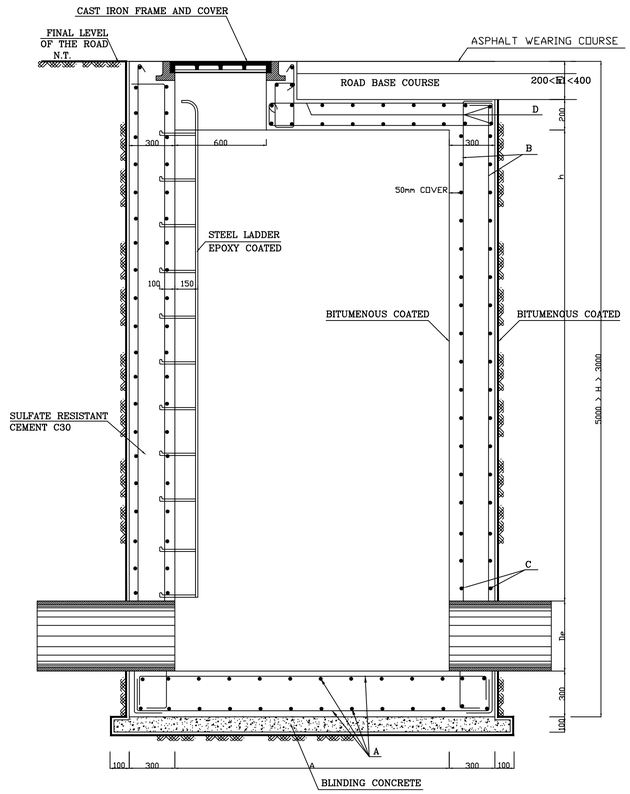
ORIGINAL DRAWING SIZE A1



TYPICAL SQUARE MANHOLE
3000mm<H<5000mm
PLAN VIEW



TYPICAL SQUARE MANHOLE
3000mm<H<5000mm
SECTION D-D



TYPICAL SQUARE MANHOLE
3000mm<H<5000mm
SECTION C-C

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS

SEWER DIAMETER (mm)	SQUARE MANHOLES		CIRCULAR MANHOLES	
	MANHOLES TYPE	A x A (mm)	MANHOLES TYPE	DIAMETER D (mm)
< 350	M1	1200 x 1200	C1	1200
350 – 450	M2	1350 x 1350	C2	1350
500 – 700	M3	1500 x 1500	C3	1500
750 – 900	M4	1800 x 1800	C4	1800
1000 – 1200	M5	2000 x 2000	C5	2000
1300 – 1600	M6	2400 x 2400	C6	2400
1800 – 2000	M7	3000 x 3000	C7	3000

MANHOLES TYPE M1	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @200	T14 @200

MANHOLES TYPE M2	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @200	T14 @200

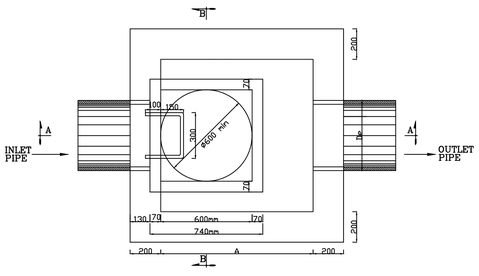
MANHOLES TYPE M3	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @165	T14 @200

MANHOLES TYPE M4	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @165	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @165	T14 @200
5m<H<7m	T12 @200	T12 @200	T14 @165	T14 @200

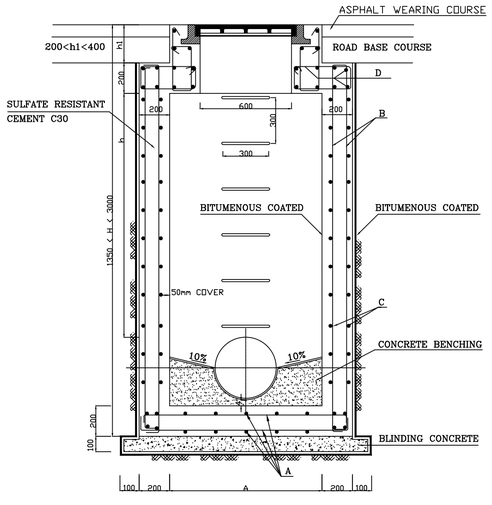
MANHOLES TYPE M5	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T14 @165	T14 @200
3m<H<5m	T12 @200	T12 @200	T14 @165	T14 @200
5m<H<7m	T14 @200	T14 @200	T16 @165	T14 @200

MANHOLES TYPE M6	A	B	C	D
1m<H<3m	T14 @200	T14 @200	T16 @165	T14 @200
3m<H<5m	T14 @200	T14 @200	T16 @165	T14 @200
5m<H<7m	T14 @200	T14 @200	T20 @165	T14 @200

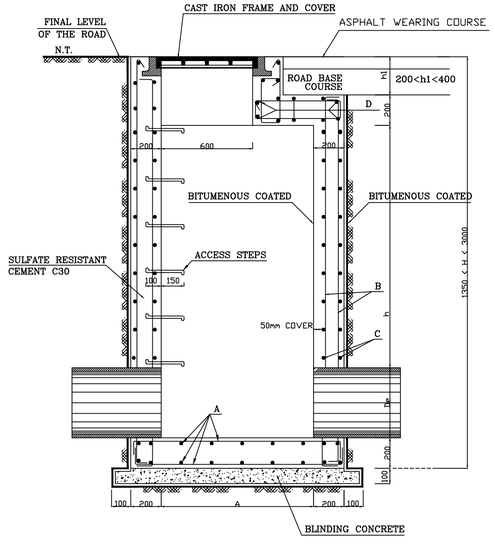
MANHOLES TYPE M7	A	B	C	D
1m<H<3m	T14 @200	T14 @200	T20 @165	T14 @200
3m<H<5m	T14 @200	T14 @200	T20 @165	T14 @200
5m<H<7m	T16 @200	T16 @200	T20 @145	T14 @200



TYPICAL SQUARE MANHOLE
1350mm<H<3000mm
PLAN VIEW



TYPICAL SQUARE MANHOLE
1350mm<H<3000mm
SECTION B-B



TYPICAL SQUARE MANHOLE
1350mm<H<3000mm
SECTION A-A

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FAX:(04) 712159

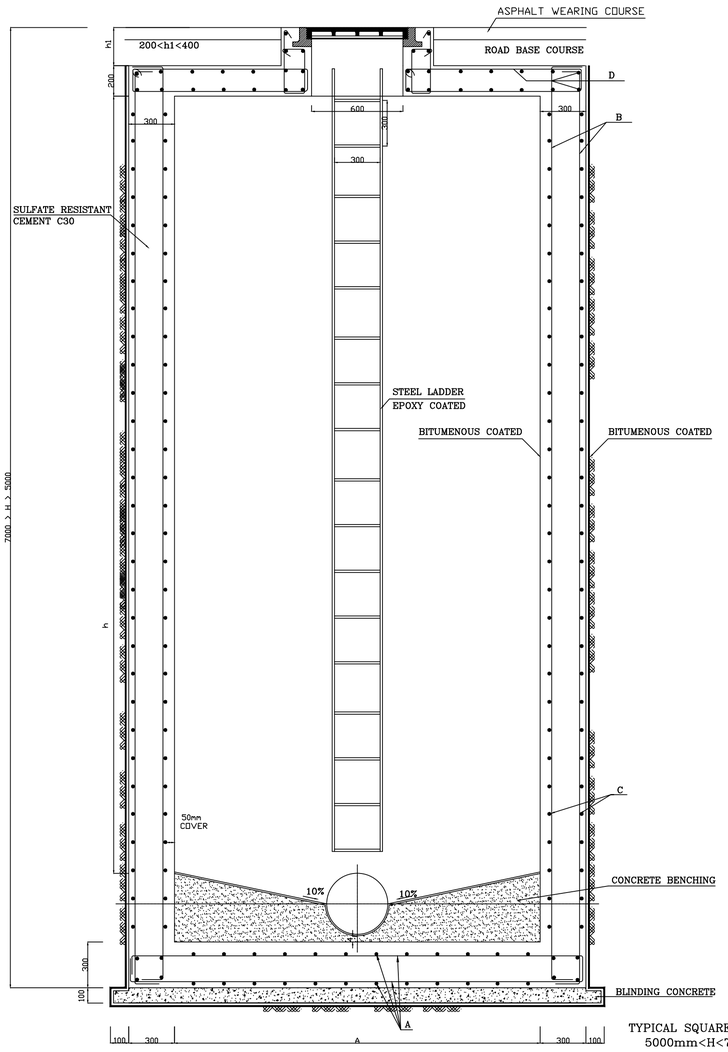
EL MINA REMAINING COASTAL SEWER COLLECTORS

STANDARD DRAWING	MANHOLES GENERAL DETAILS

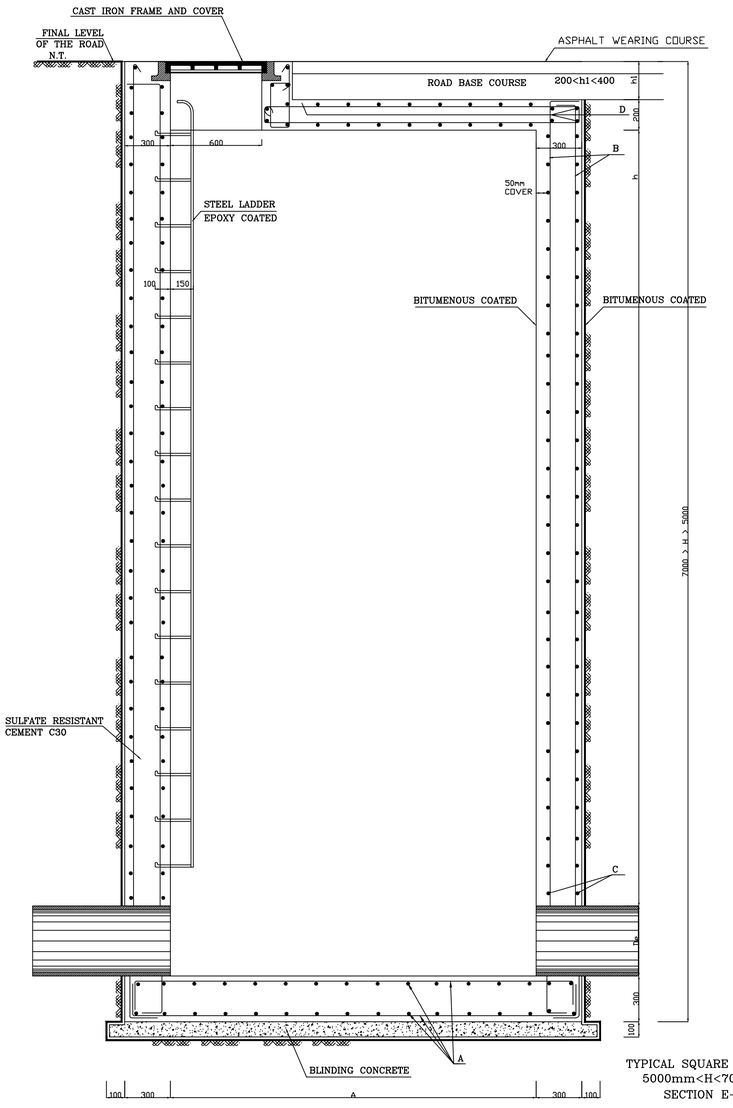
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W-STDP02	A. ANIS	J. DAHER	W. SEIFEDDINE

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	2/11	451W-STDP02

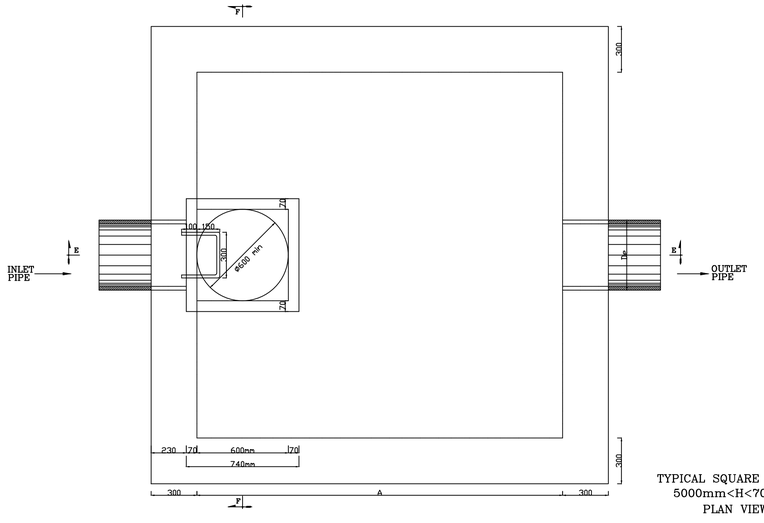
ORIGINAL DRAWING SIZE A1



TYPICAL SQUARE MANHOLE
5000mm<H<7000mm
SECTION F-F



TYPICAL SQUARE MANHOLE
5000mm<H<7000mm
SECTION E-E



TYPICAL SQUARE MANHOLE
5000mm<H<7000mm
PLAN VIEW

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS

SEWER DIAMETER (mm)	SQUARE MANHOLES		CIRCULAR MANHOLES	
	MANHOLES TYPE	A x A (mm)	MANHOLES TYPE	DIAMETER D (mm)
< 350	M1	1200 x 1200	C1	1200
350 – 450	M2	1350 x 1350	C2	1350
500 – 700	M3	1500 x 1500	C3	1500
750 – 900	M4	1800 x 1800	C4	1800
1000 – 1200	M5	2000 x 2000	C5	2000
1300 – 1600	M6	2400 x 2400	C6	2400
1800 – 2000	M7	3000 x 3000	C7	3000

MANHOLES TYPE M1	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @200	T14 @200

MANHOLES TYPE M2	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @200	T14 @200

MANHOLES TYPE M3	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @200	T14 @200
5m<H<7m	T12 @200	T12 @200	T12 @165	T14 @200

MANHOLES TYPE M4	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @165	T14 @200
3m<H<5m	T12 @200	T12 @200	T12 @165	T14 @200
5m<H<7m	T12 @200	T12 @200	T14 @165	T14 @200

MANHOLES TYPE M5	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T14 @165	T14 @200
3m<H<5m	T12 @200	T12 @200	T14 @165	T14 @200
5m<H<7m	T14 @200	T14 @200	T16 @165	T14 @200

MANHOLES TYPE M6	A	B	C	D
1m<H<3m	T14 @200	T14 @200	T16 @165	T14 @200
3m<H<5m	T14 @200	T14 @200	T16 @165	T14 @200
5m<H<7m	T14 @200	T14 @200	T20 @165	T14 @200

MANHOLES TYPE M7	A	B	C	D
1m<H<3m	T14 @200	T14 @200	T20 @165	T14 @200
3m<H<5m	T14 @200	T14 @200	T20 @165	T14 @200
5m<H<7m	T16 @200	T16 @200	T20 @145	T14 @200

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FAX:(04) 712159

EL MINA REMAINING COASTAL SEWER COLLECTORS

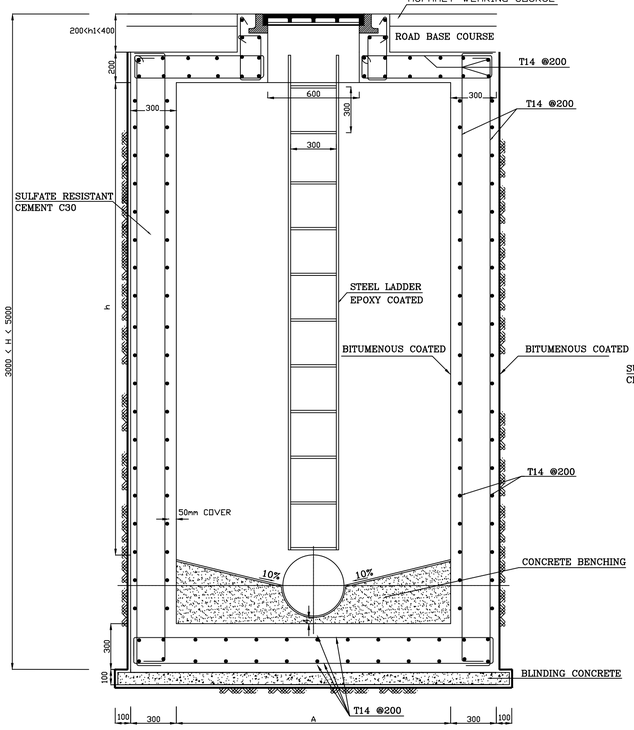
STANDARD DRAWING

MANHOLES
GENERAL DETAILS

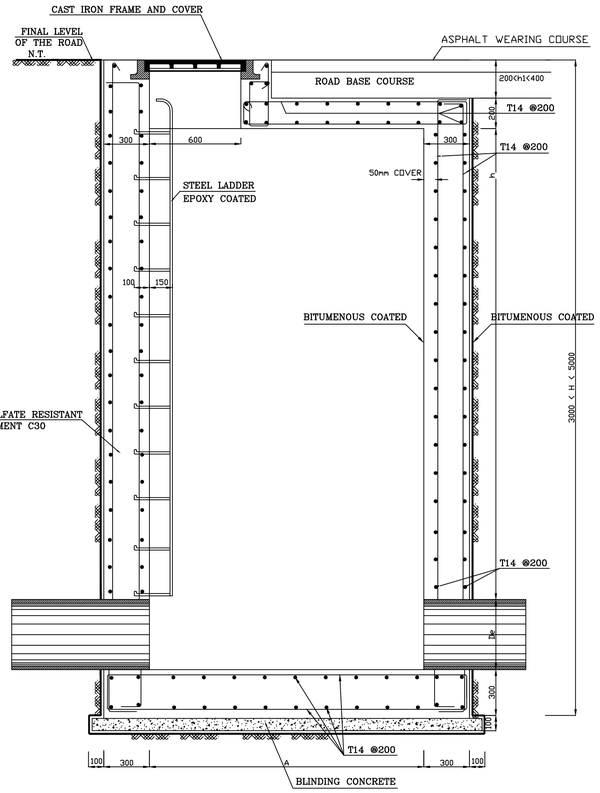
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W-STDP03	A. ANIS	J. DAHER	W. SEIFEDDINE

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	3/11	451W-STDP03

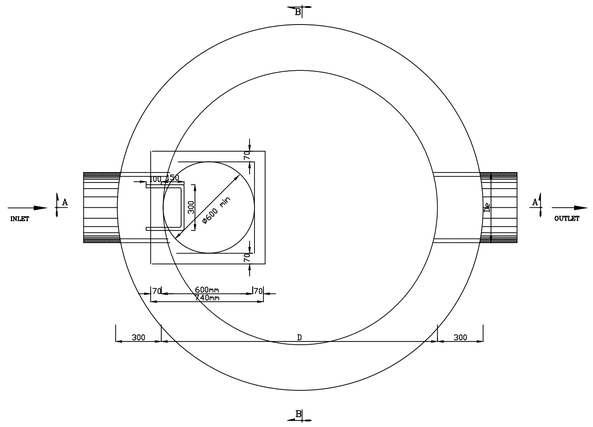
ORIGINAL DRAWING SIZE A1

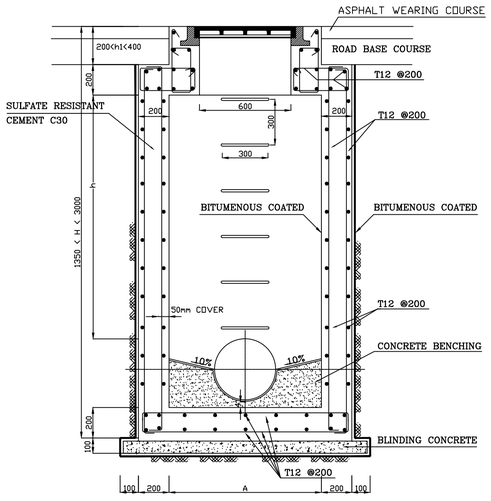


TYPICAL CIRCULAR MANHOLE
3000mm<H<5000mm
SECTION B–B

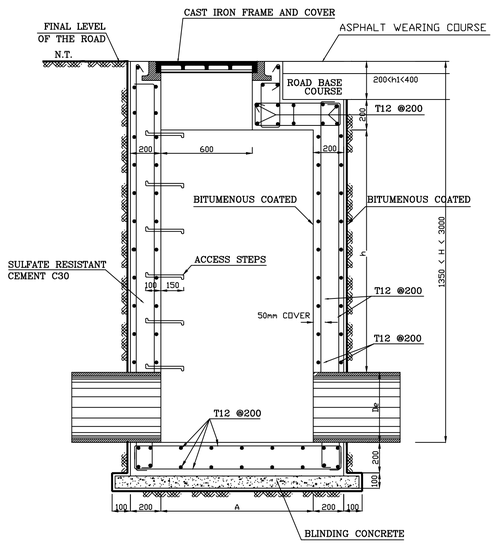


TYPICAL CIRCULAR MANHOLE
3000mm<H<5000mm
SECTION A–A

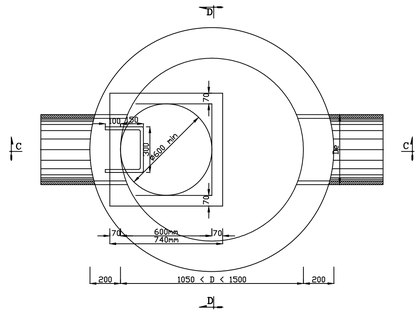




TYPICAL CIRCULAR MANHOLE
1350mm<H<3000mm
SECTION D–D



TYPICAL CIRCULAR MANHOLE
1350mm<H<3000mm
SECTION C–C



NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS
- THE REINFORCEMENT AND WALL THICKNESS FOR EACH SETTLING MANHOLES TYPES ARE SIMILAR TO EACH NORMAL MANHOLE TYPE.
- EACH NORMAL MANHOLE TYPE SHELL HAVE A CORRESPONDING SETTLING MANHOLE HAVING 2,5A X A AS DIMENSIONS

SEWER DIAMETER (mm)	SQUARE MANHOLES		CIRCULAR MANHOLES	
	MANHOLES TYPE	A x A (mm)	MANHOLES TYPE	DIAMETER D (mm)
< 350	M1	1200 x 1200	C1	1200
350 – 450	M2	1350 x 1350	C2	1350
500 – 700	M3	1500 x 1500	C3	1500
750 – 900	M4	1800 x 1800	C4	1800
1000 – 1200	M5	2000 x 2000	C5	2000
1300 – 1600	M6	2400 x 2400	C6	2400
1800 – 2000	M7	3000 x 3000	C7	3000

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EL MINA REMAINING COASTAL SEWER COLLECTORS

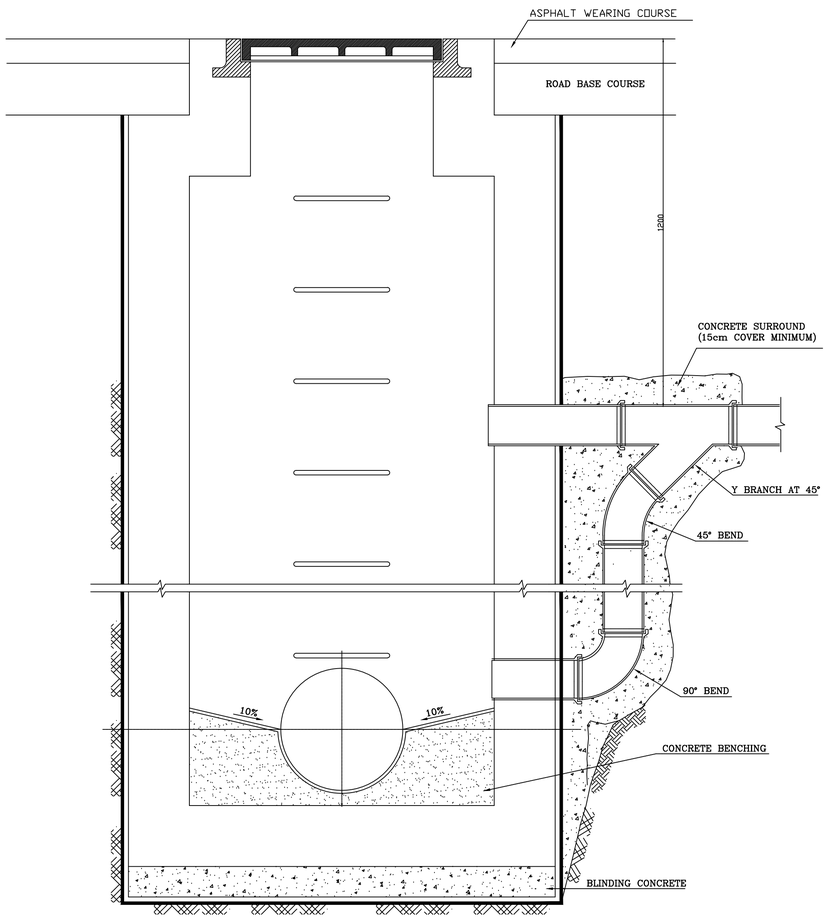
STANDARD DRAWING

MANHOLES
GENERAL DETAILS

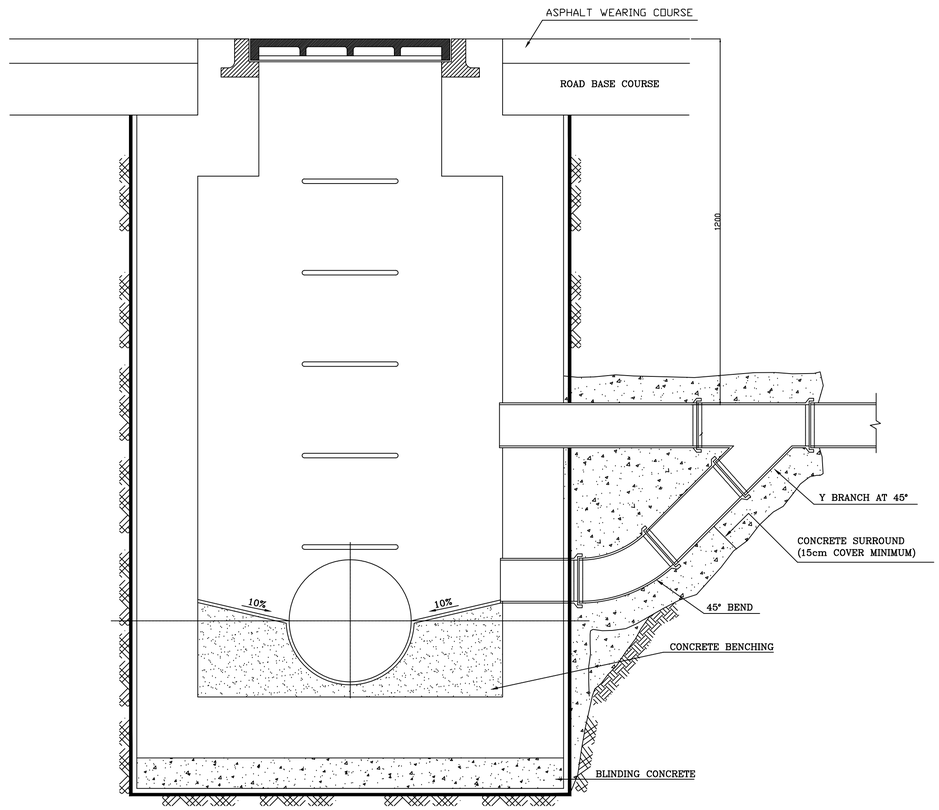
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP04	A. ANIS	J. DAHER	W. SEIFEDDINE

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	4/11	451W–STDP04

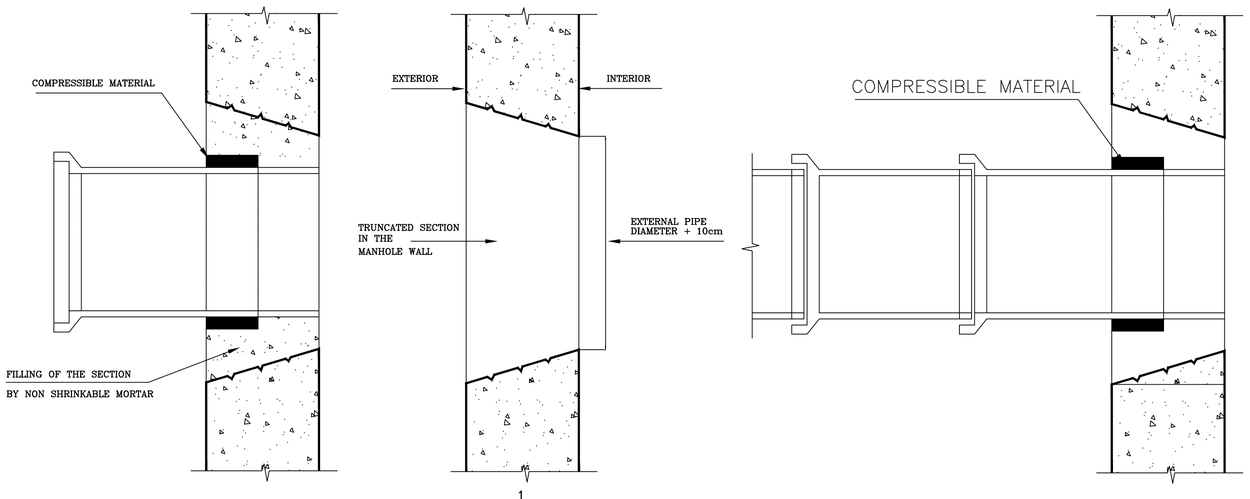
ORIGINAL DRAWING SIZE A1



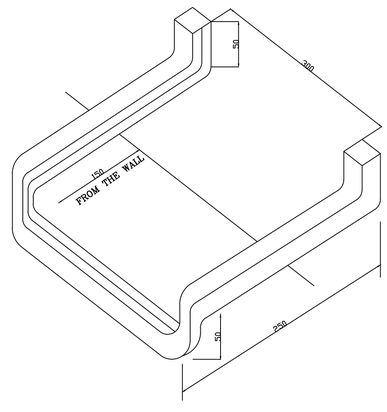
DROP MANHOLE
EXCESSIVE DROP > 2000mm



DROP MANHOLE
1000mm≤MODERATE DROP ≤ 2000mm
N.B: NO EXTERNAL DROP NEEDED FOR DROP <1000mm



DETAILS FOR THE CONNECTION
OF A PIPE TO A MANHOLE
FOR OTHER PIPES



DETAIL OF AN
ACCESS STEP

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS

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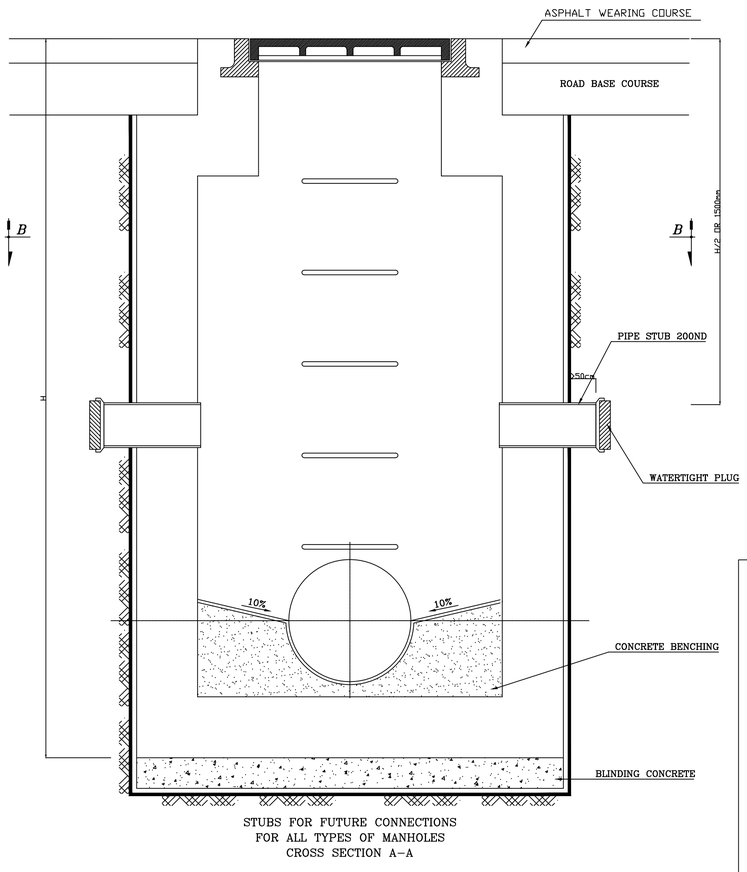
EL MINA REMAINING COASTAL SEWER COLLECTORS

STANDARD DRAWING	MANHOLES GENERAL DETAILS

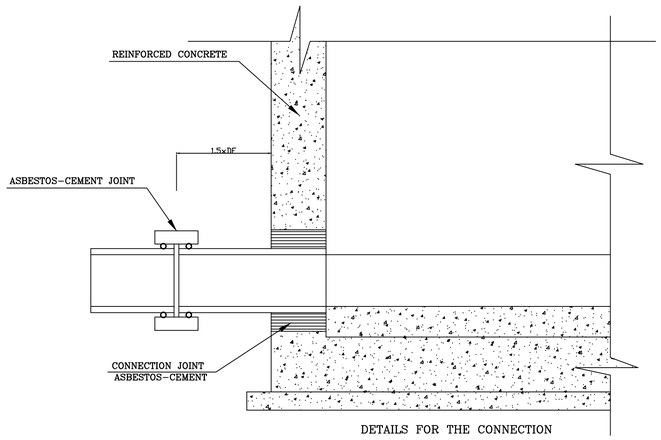
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP05	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	5/11	451W–STDP05

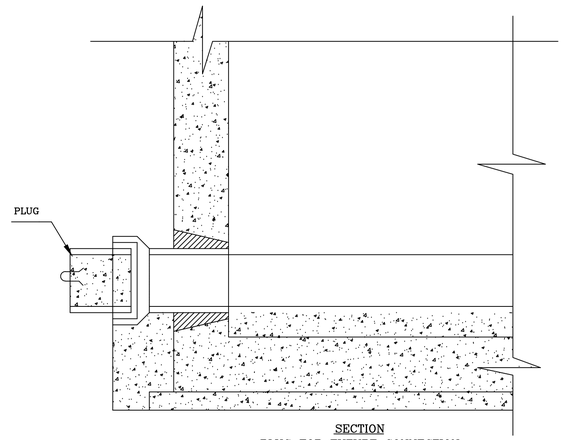
ORIGINAL DRAWING SIZE A1



STUBS FOR FUTURE CONNECTIONS
FOR ALL TYPES OF MANHOLES
CROSS SECTION A–A

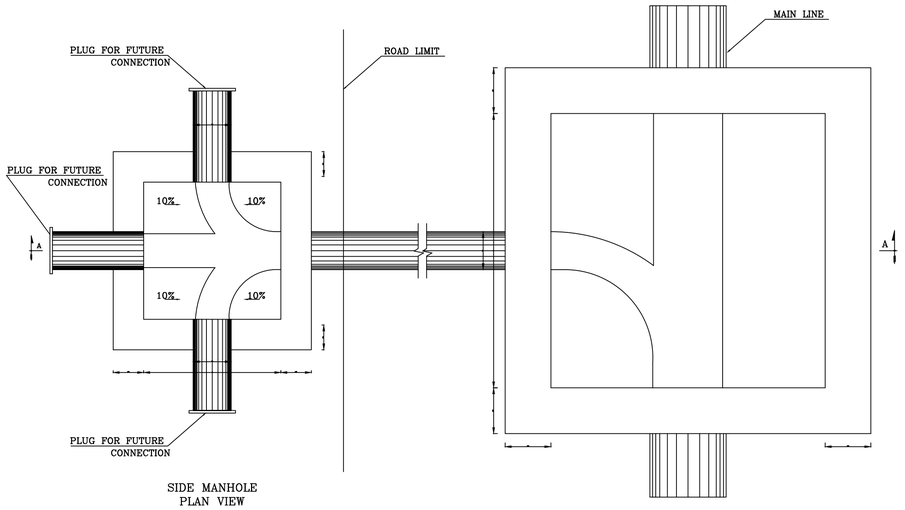


DETAILS FOR THE CONNECTION
OF A PIPE TO A MANHOLE
FOR ASBESTOS–CEMENT PIPES

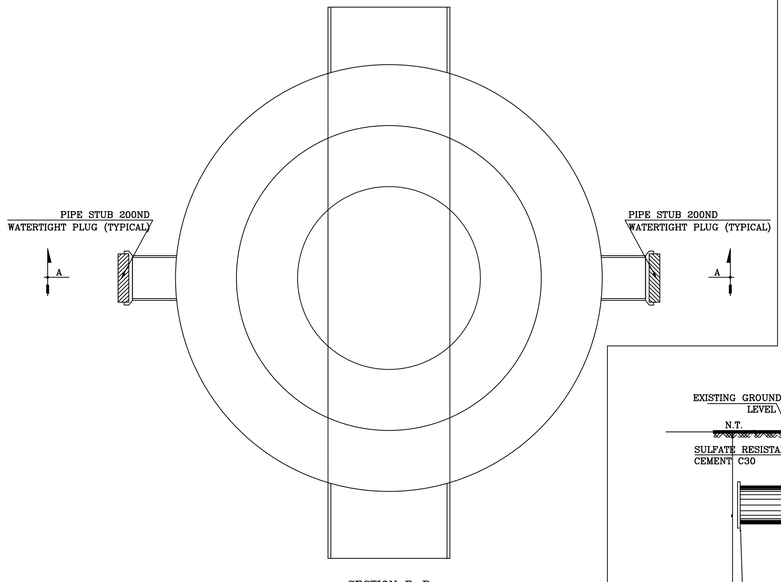


SECTION
PLUG FOR FUTURE CONNECTION
FOR THE UPPER MOST MANHOLE

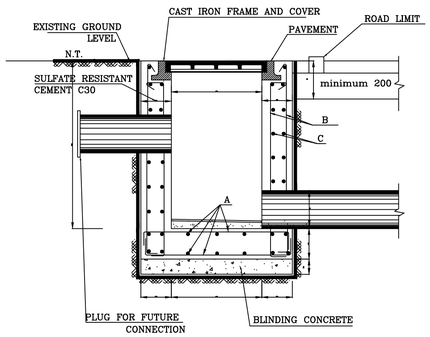
LATERAL CONNECTION



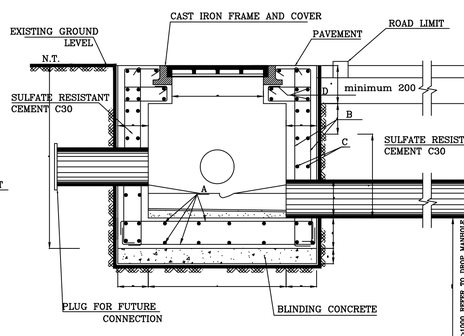
SIDE MANHOLE
PLAN VIEW
SCALE 1:20



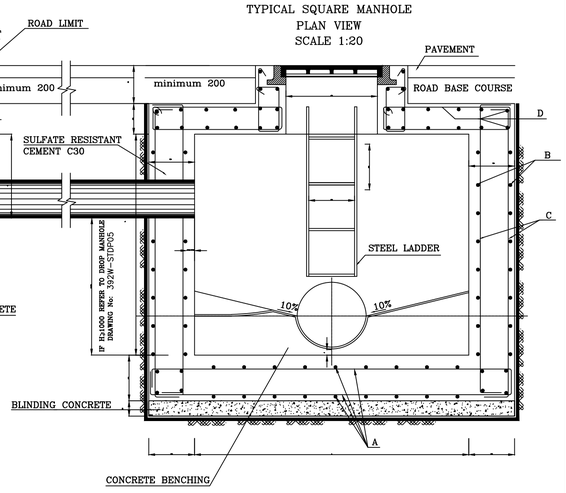
SECTION B–B



BOX (600x600) FOR LATERAL CONNECTION
NOT TO SCALE



SIDE MANHOLE
SECTION A–A
SCALE 1:20



TYPICAL SQUARE MANHOLE
PLAN VIEW
SCALE 1:20

TYPICAL SQUARE MANHOLE
SECTION A–A
SCALE 1:20

NOTES:

– ALL DIMENSIONS ARE IN MILLIMETERS

– SIDE MANHOLES DIMENSIONS:

SEWER DIAMETER (mm)	SQUARE MANHOLES	CIRCULAR MANHOLES
	A x A (mm)	DIAMETER D (mm)
200	1000 x 1000	1000

– SIDE MANHOLES REINFORCEMENT:

SIDE MANHOLES	A	B	C	D
1m<H<3m	T12 @200	T12 @200	T12 @200	T14 @200

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EL MINA REMAINING COASTAL SEWER COLLECTORS

STANDARD DRAWING	MANHOLES GENERAL DETAILS

FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP06	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	6/11	451W–STDP06

ORIGINAL DRAWING SIZE A1

ANCHOR BLOCKS FOR BURRIED SLOPED PIPES

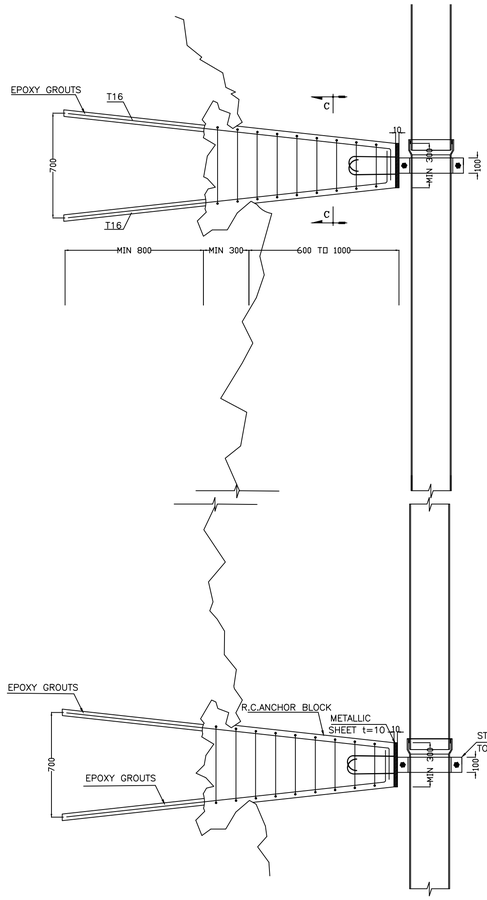
Diam (mm)	25%			30%			35%			Slope 40%			45%			50% *		
	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)
1000	–	–	–	0.300	1.700	1.850	0.300	1.750	1.850	0.500	1.800	1.850	0.650	1.900	1.850	0.800	1.950	1.850
900	–	–	–	0.300	1.600	1.750	0.300	1.650	1.750	0.450	1.700	1.750	0.600	1.750	1.750	0.700	1.850	1.750
800	–	–	–	0.300	1.500	1.600	0.300	1.550	1.600	0.450	1.600	1.600	0.550	1.650	1.600	0.650	1.700	1.600
700	–	–	–	0.300	1.400	1.450	0.300	1.450	1.450	0.400	1.450	1.450	0.500	1.500	1.450	0.600	1.600	1.450
600	–	–	–	0.300	1.300	1.350	0.300	1.350	1.350	0.350	1.350	1.350	0.450	1.400	1.350	0.550	1.450	1.350
500	–	–	–	0.300	1.200	1.200	0.300	1.200	1.200	0.300	1.250	1.200	0.350	1.250	1.200	0.450	1.300	1.200
450	–	–	–	0.300	1.150	1.150	0.300	1.150	1.150	0.300	1.200	1.150	0.350	1.200	1.150	0.400	1.250	1.150
400	–	–	–	0.300	1.100	1.050	0.300	1.100	1.050	0.300	1.150	1.050	0.300	1.150	1.050	0.400	1.200	1.050
350	–	–	–	0.300	1.050	1.000	0.300	1.050	1.000	0.300	1.100	1.000	0.300	1.100	1.000	0.350	1.150	1.000
300	–	–	–	0.300	1.000	0.950	0.300	1.000	0.950	0.300	1.000	0.950	0.300	1.050	0.950	0.300	1.050	0.950
250	–	–	–	0.300	0.950	0.850	0.300	0.950	0.850	0.300	0.950	0.850	0.300	1.000	0.850	0.300	1.000	0.850
200	–	–	–	0.300	0.900	0.800	0.300	0.900	0.800	0.300	0.900	0.800	0.300	0.950	0.800	0.300	0.950	0.800
150	–	–	–	0.300	0.850	0.750	0.300	0.850	0.750	0.300	0.850	0.750	0.300	0.900	0.750	0.300	0.900	0.750
125	–	–	–	0.300	0.800	0.700	0.300	0.800	0.700	0.300	0.850	0.700	0.300	0.850	0.700	0.300	0.850	0.700
100	–	–	–	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.850	0.650
80	–	–	–	0.300	0.750	0.650	0.300	0.750	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650

** FOR SLOPE > 50% SEE NOTE*
** FOR DIAMETER > 1000mm ALL THE TRENCH WILL BE FILLED BY MASSE CONCRETE (REINFORCED CONCRETE FOR SLOPES > 35%)*

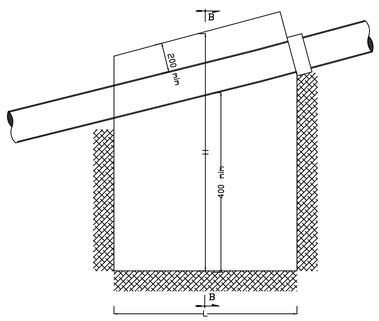
ANCHOR BLOCKS FOR UNCOVERED SLOPED PIPES.

Diam (mm)	25%			30%			35%			Slope 40%			45%			50%		
	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)	L (m)	H (m)	B (m)
1000	1.200	1.800	1.600	1.350	1.900	1.850	1.450	1.950	1.850	1.550	2.050	1.850	1.600	2.100	1.850	1.650	2.200	1.850
900	1.100	1.700	1.500	1.250	1.750	1.750	1.350	1.850	1.750	1.400	1.900	1.750	1.450	1.950	1.750	1.500	2.050	1.750
800	1.050	1.600	1.400	1.150	1.650	1.600	1.250	1.700	1.600	1.300	1.750	1.600	1.350	1.850	1.600	1.400	1.900	1.600
700	0.950	1.450	1.300	1.050	1.500	1.450	1.150	1.600	1.450	1.200	1.650	1.450	1.250	1.700	1.450	1.300	1.750	1.450
600	0.800	1.350	1.200	0.900	1.400	1.350	0.950	1.450	1.350	1.050	1.500	1.350	1.100	1.550	1.350	1.100	1.600	1.350
500	0.650	1.250	1.100	0.750	1.250	1.200	0.800	1.300	1.200	0.850	1.350	1.200	0.900	1.400	1.200	0.950	1.450	1.200
450	0.600	1.150	1.050	0.700	1.200	1.150	0.750	1.250	1.150	0.800	1.300	1.150	0.850	1.350	1.150	0.850	1.350	1.150
400	0.550	1.100	1.000	0.650	1.150	1.050	0.700	1.200	1.050	0.750	1.200	1.050	0.750	1.250	1.050	0.800	1.300	1.050
350	0.500	1.050	0.750	0.550	1.100	1.000	0.600	1.100	1.000	0.650	1.150	1.000	0.700	1.200	1.000	0.700	1.200	1.000
300	0.450	1.000	0.700	0.500	1.000	0.950	0.550	1.050	0.950	0.550	1.050	0.950	0.600	1.100	0.950	0.600	1.150	0.950
250	0.350	0.950	0.650	0.400	0.950	0.850	0.450	1.000	0.850	0.500	1.000	0.850	0.500	1.050	0.850	0.500	1.050	0.850
200	0.300	0.850	0.600	0.300	0.900	0.800	0.350	0.900	0.800	0.400	0.950	0.800	0.400	0.950	0.800	0.400	0.950	0.800
150	0.300	0.800	0.550	0.300	0.850	0.750	0.300	0.850	0.750	0.300	0.850	0.750	0.350	0.900	0.750	0.350	0.900	0.750
125	0.300	0.800	0.525	0.300	0.800	0.700	0.300	0.800	0.700	0.300	0.850	0.700	0.300	0.850	0.700	0.300	0.850	0.700
100	0.300	0.750	0.500	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.850	0.650
80	0.300	0.750	0.480	0.300	0.750	0.650	0.300	0.750	0.650	0.300	0.800	0.650	0.300	0.800	0.650	0.300	0.800	0.650

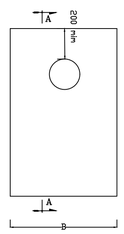
** FOR DIAMETER > 1000mm THE PIPE SHOULD BE BURIED WITH A MINIMUM COVER >200mm AND ALL THE TRENCHWILL BE FILLED BY MASSE CONCRETE (REINFORCED CONCRETE FOR SLOPES > 35%)*



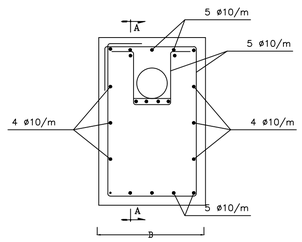
VERTICAL ANCHORS ON ROCK
FOR SLOPE > 50 % AND FOR UNCOVERED PIPES



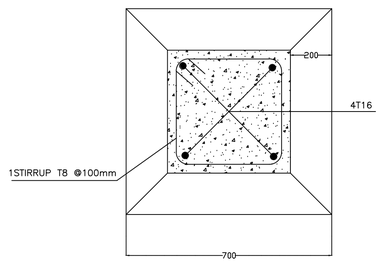
SECTION A–A
ANCHOR BLOCK FOR BURRIED
OR UNCOVERED GROUND PIPES
SLOPE ⩽ 50%



SECTION B–B
ANCHOR BLOCK FOR BURRIED
OR UNCOVERED GROUND PIPES
SLOPE ⩽ 50%



SECTION B–B
ANCHOR BLOCK FOR BURRIED PIPES
TYPICAL REINFORCEMENT DETAIL
SLOPE ⩽ 50%



SECTION C–C
NOT TO SCALE

NOTES:

– ALL DIMENSIONS ARE IN MILLIMETERS

WHEN THE SLOPE IS MORE THEN 50 % ALL THE PIPELINE TRENCHE WILL BE FILLED BY A MASS CONCRETE

BASIC DATA:

SOIL DENSITY	1800	kg/m3
PIPE MATERIAL DENSITY	7050	kg/m3
WATER DENSITY	1000	kg/m3
CONCRETE DENSITY	2300	kg/m3
SOIL INTERNAL FICTION ANGLE	25°	
SECURITY FACTOR	1.2	
SOIL BEARING CAPACITY	3	kg/cm2
PIPE THIKNESS	0.006	mm
SOIL–CONCRETE FRICTION	2/3 * 25°	

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EL MINA REMAINING COASTAL SEWER COLLECTORS

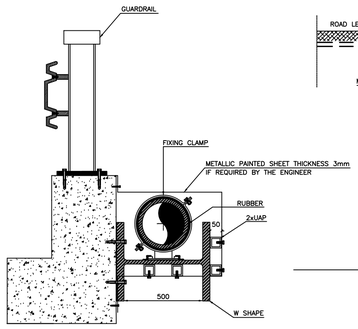
STANDARD DRAWING

SEWER NETWORKS
PIPELINE ANCHOR BLOCKS

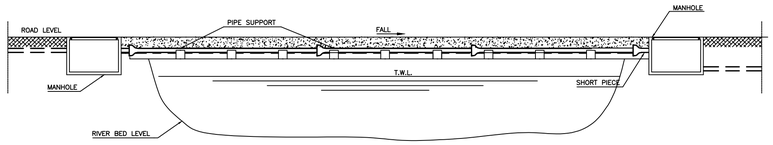
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP07	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	7/11	451W–STDP07

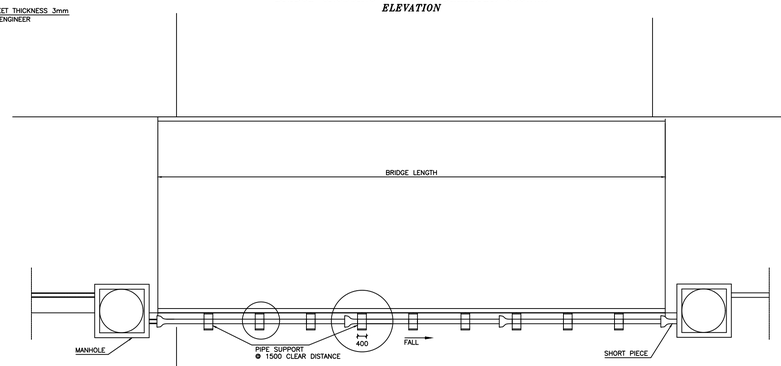
ORIGINAL DRAWING SIZE A1



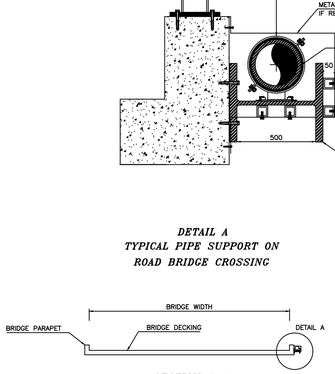
DETAIL A
TYPICAL PIPE SUPPORT ON
ROAD BRIDGE CROSSING



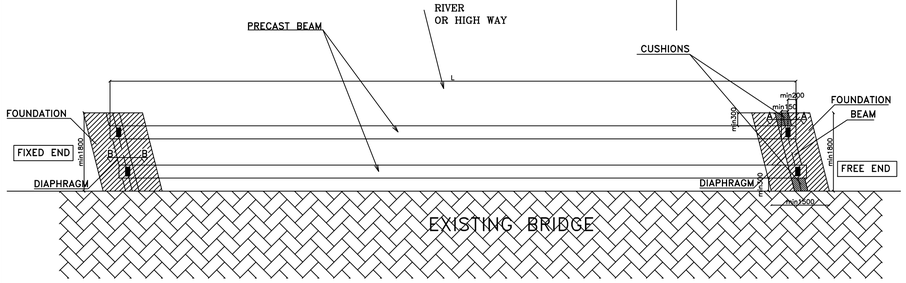
BRIDGE CROSSING FOR PIPE DIAMETER=200mm
ELEVATION



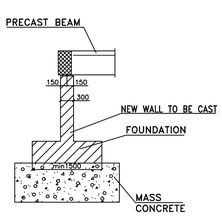
BRIDGE CROSSING FOR PIPE DIAMETER=200mm
PLAN



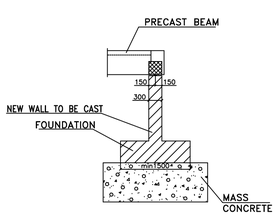
SECTION A-A



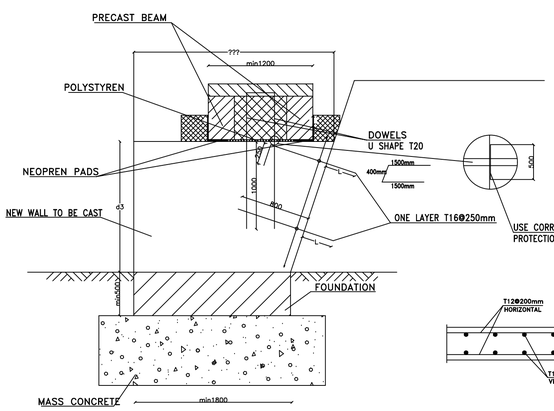
PLAN VIEW
SCALE 1:75



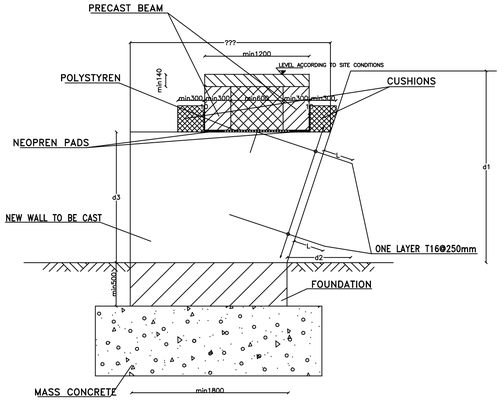
LONGITUDINAL SECTION AT FIXED END
SECTION B-B
NOT TO SCALE



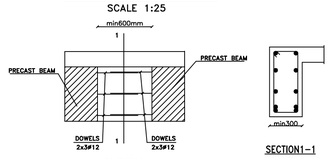
LONGITUDINAL SECTION AT FREE END
SECTION A-A
NOT TO SCALE



SECTION AT FIXED END
SCALE 1:25

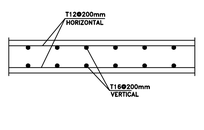


SECTION AT FREE END
SCALE 1:25

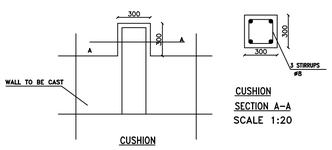


DIAPHRAGM

SECTION1-1
SCALE 1:20

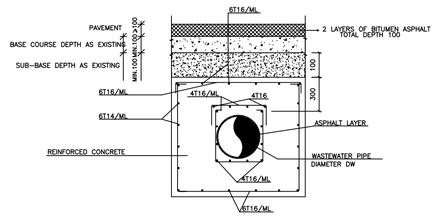


TYPICAL WALL REINFORCEMENT
SCALE 1:20

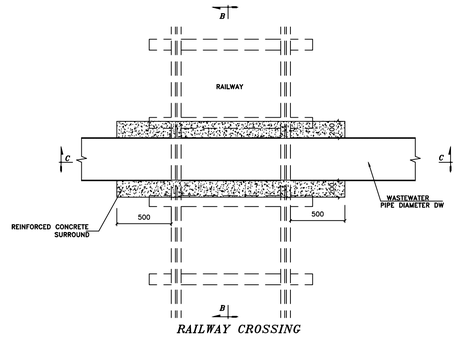


CUSHION
SCALE 1:20

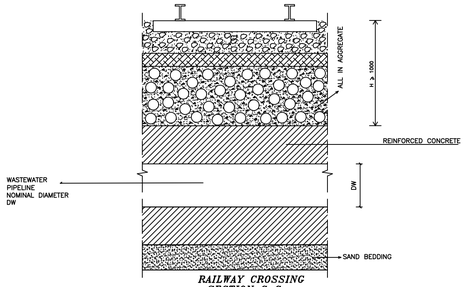
CUSHION
SECTION A-A
SCALE 1:20



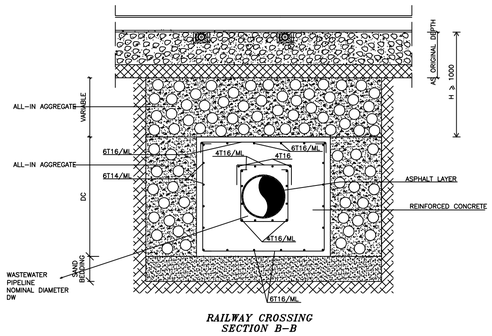
ALONG WATER COURSES
NOT TO SCALE



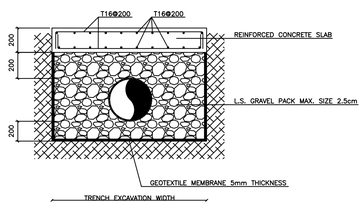
RAILWAY CROSSING



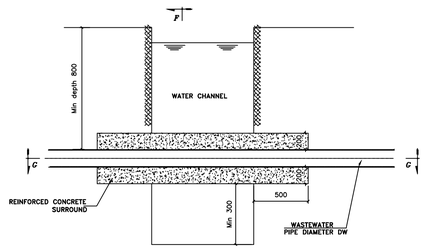
RAILWAY CROSSING
SECTION C-C



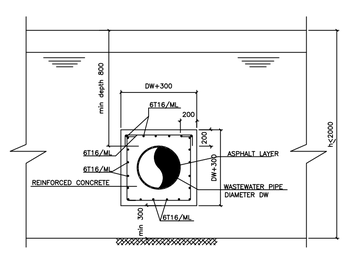
RAILWAY CROSSING
SECTION B-B



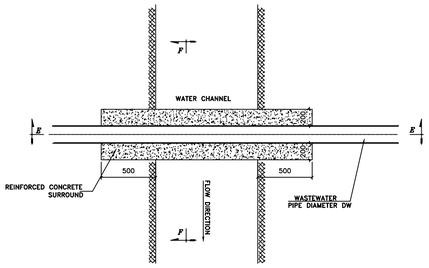
GRAVEL SURROUNDS AND CONCRETE SLAB FOR 800mm PIPE
NOT TO SCALE



WATER CHANNEL CROSSING (TYPE II)
SECTION E-E



WATER CHANNEL CROSSING (TYPE II)
SECTION F-F



WATER CHANNEL CROSSING (TYPE II)
SECTION G-G

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS

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FAX:(04) 712159

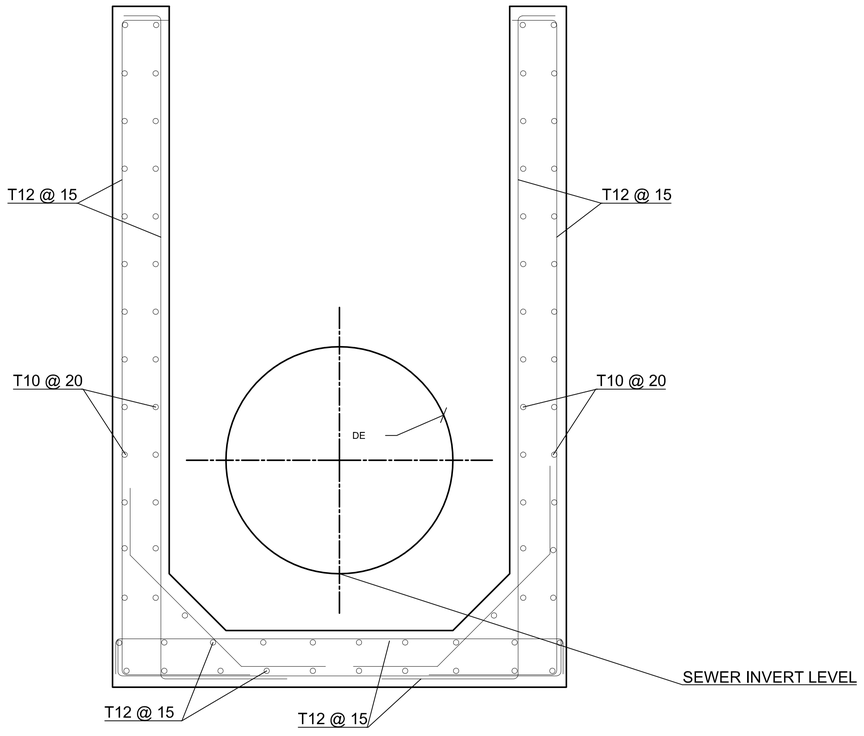
EL MINA REMAINING COASTAL SEWER COLLECTORS

STANDARD DRAWING	BRIDGE CROSSING

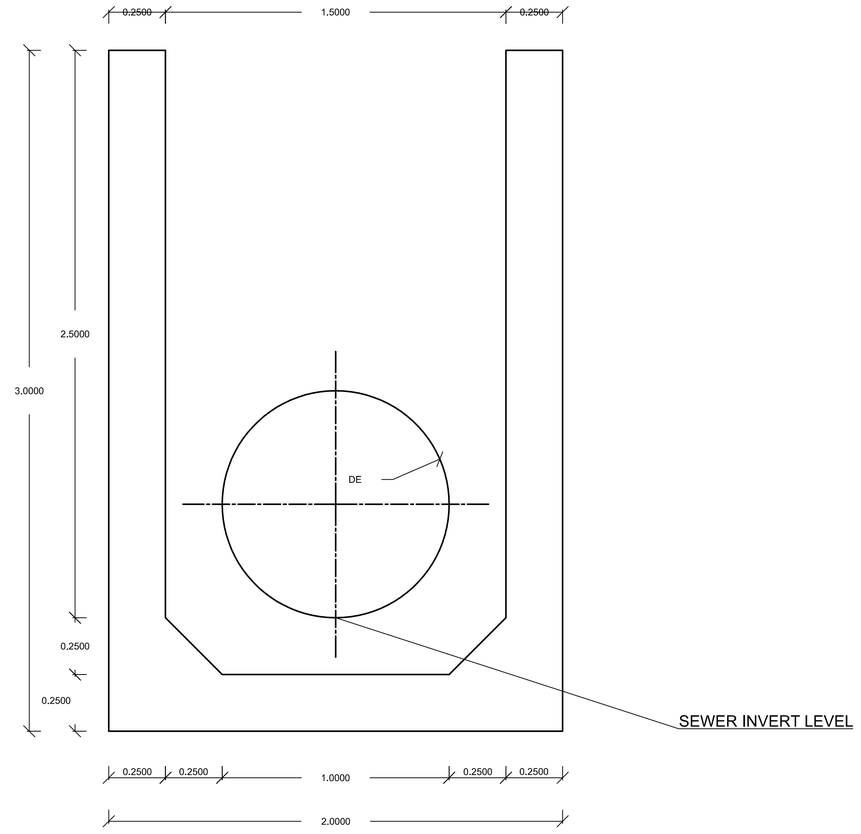
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W-STDP08	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	8/11	451W-STDP08

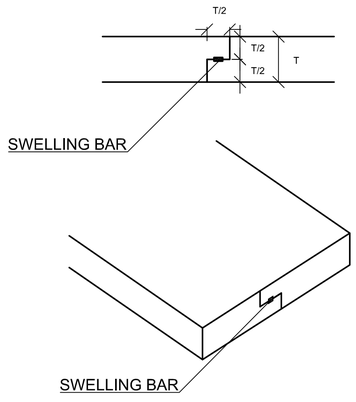
ORIGINAL DRAWING SIZE A1

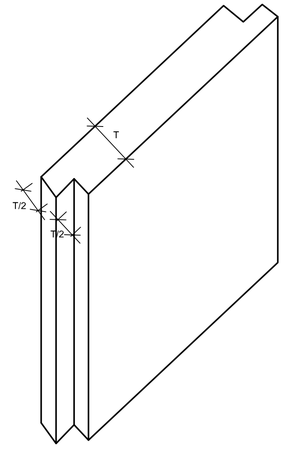


PRECAST CONCRETE STRUCYURE
H=3m – REINFORCEMENT DETAILS



PRECAST CONCRETE STRUCYURE
H=3m – REINFORCEMENT DETAILS





NOTES:

– ALL DIMENSIONS ARE IN METERS

Rev.	Date	Dsgn	Drwn	Chk'd	Appr'd

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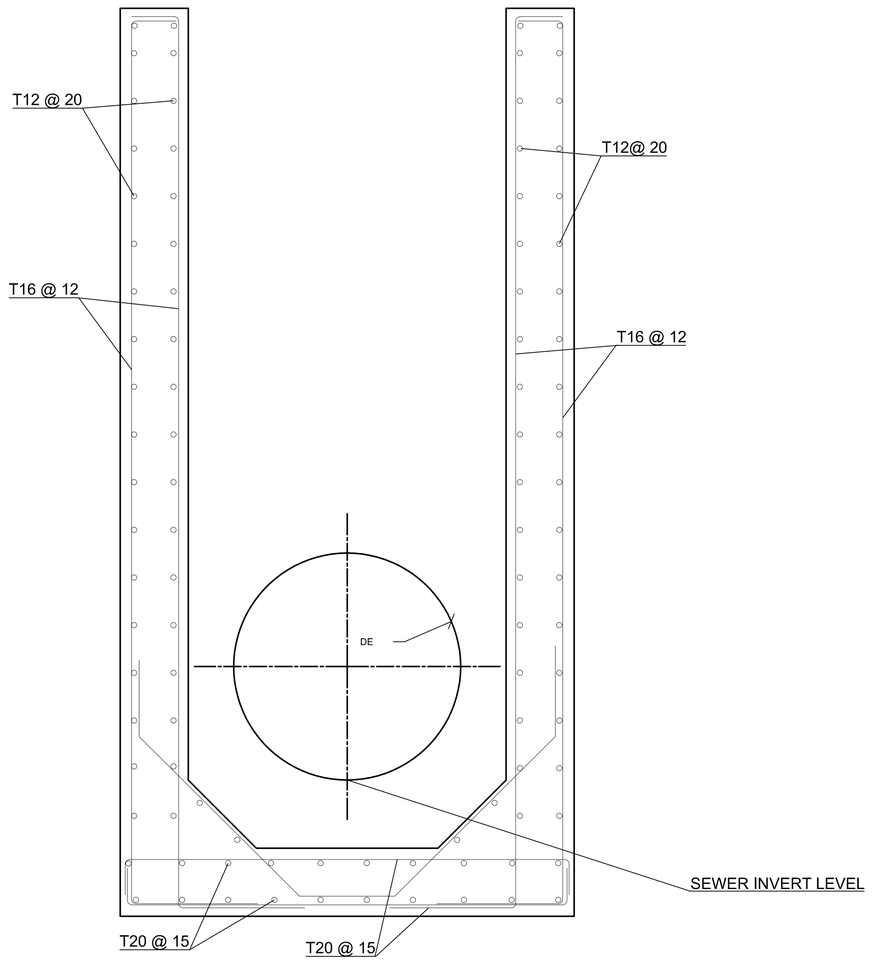
STANDARD DRAWING	GENERAL DETAILS PIPE TRENCH DETAILS BELOW WATER TABLE

FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP09	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	9/11	451W–STDP09

ORIGINAL DRAWING SIZE A1



PRECAST CONCRETE STRUCYURE
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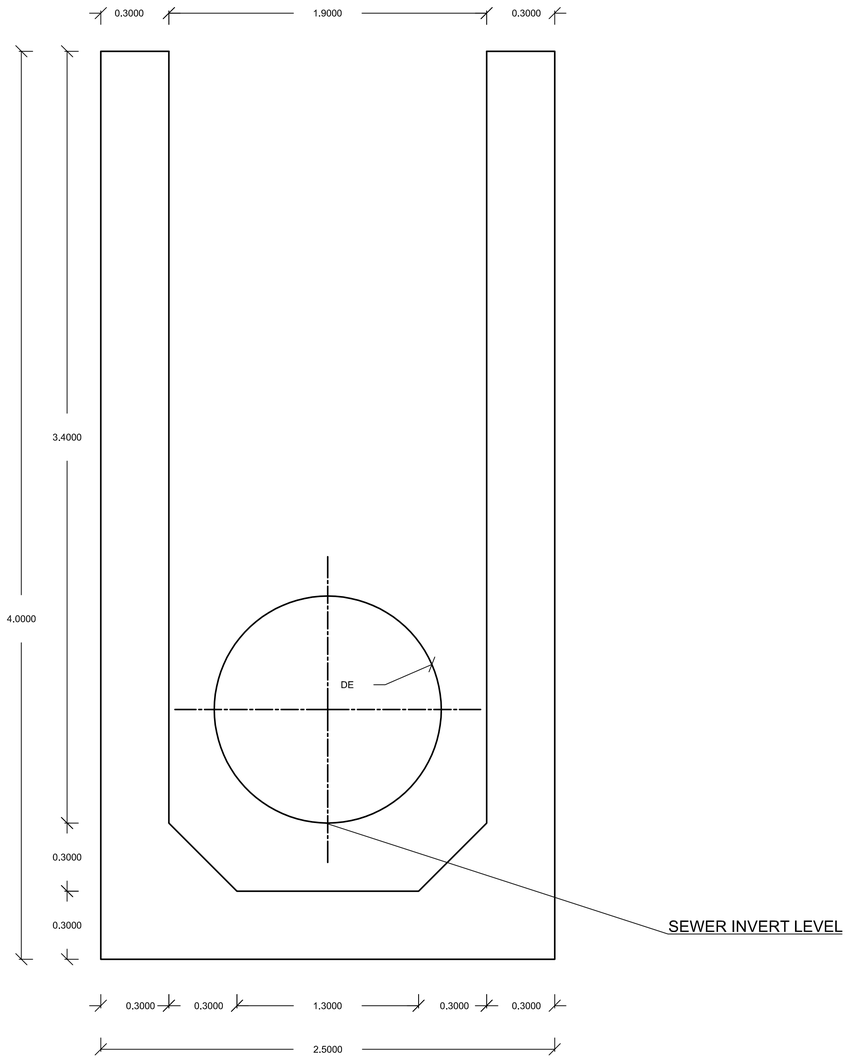
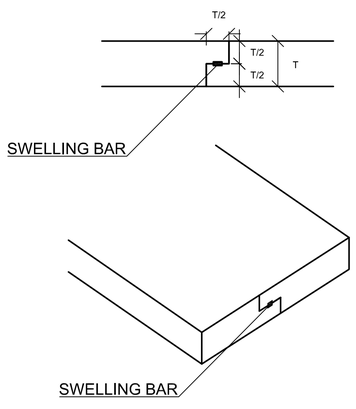
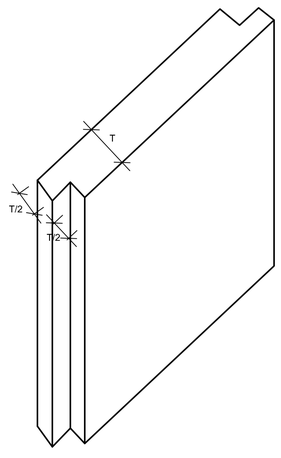


PRECAST CONCRETE STRUCYURE
H=4m – REINFORCEMENT DETAILS





NOTES:

– ALL DIMENSIONS ARE IN METERS

Rev.	Date	Dsgn	Drwn	Chk'd	Appr'd

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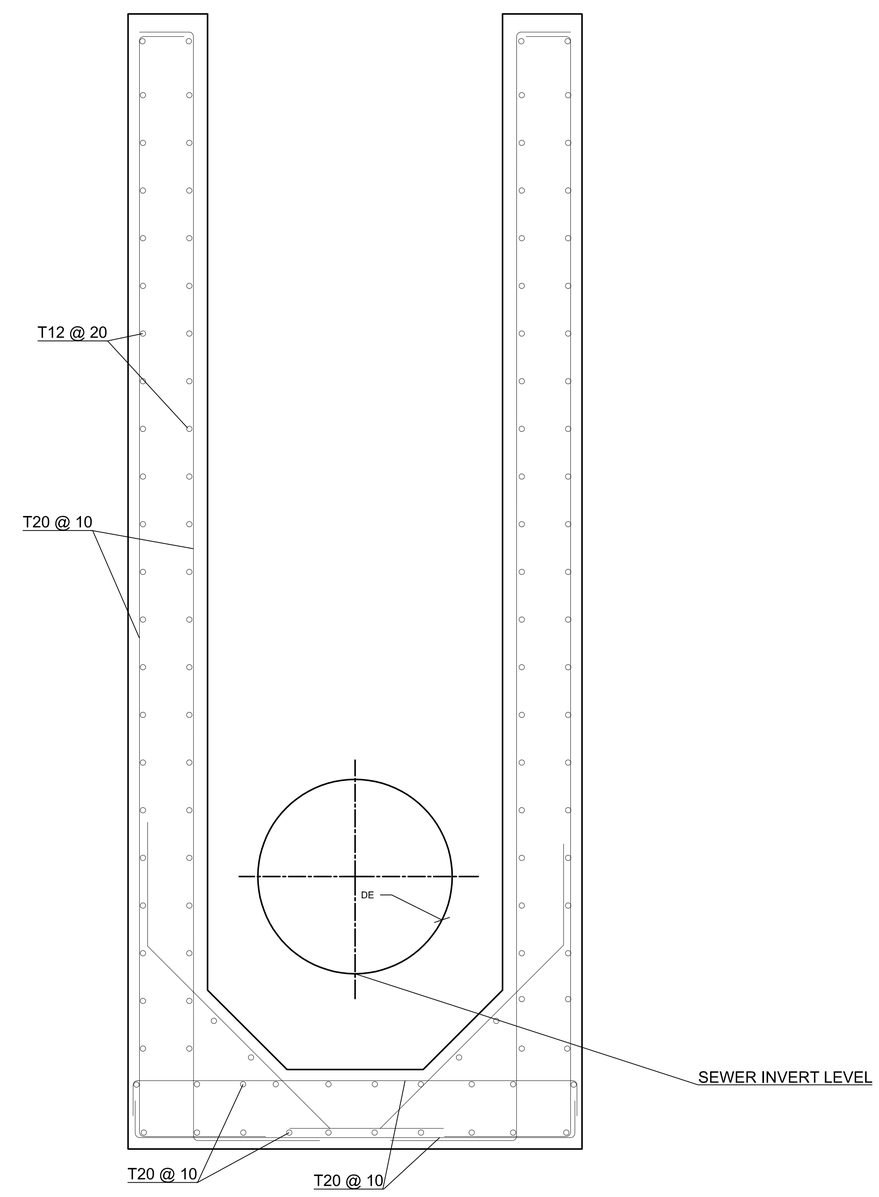
STANDARD DRAWING	GENERAL DETAILS PIPE TRENCH DETAILS BELOW WATER TABLE

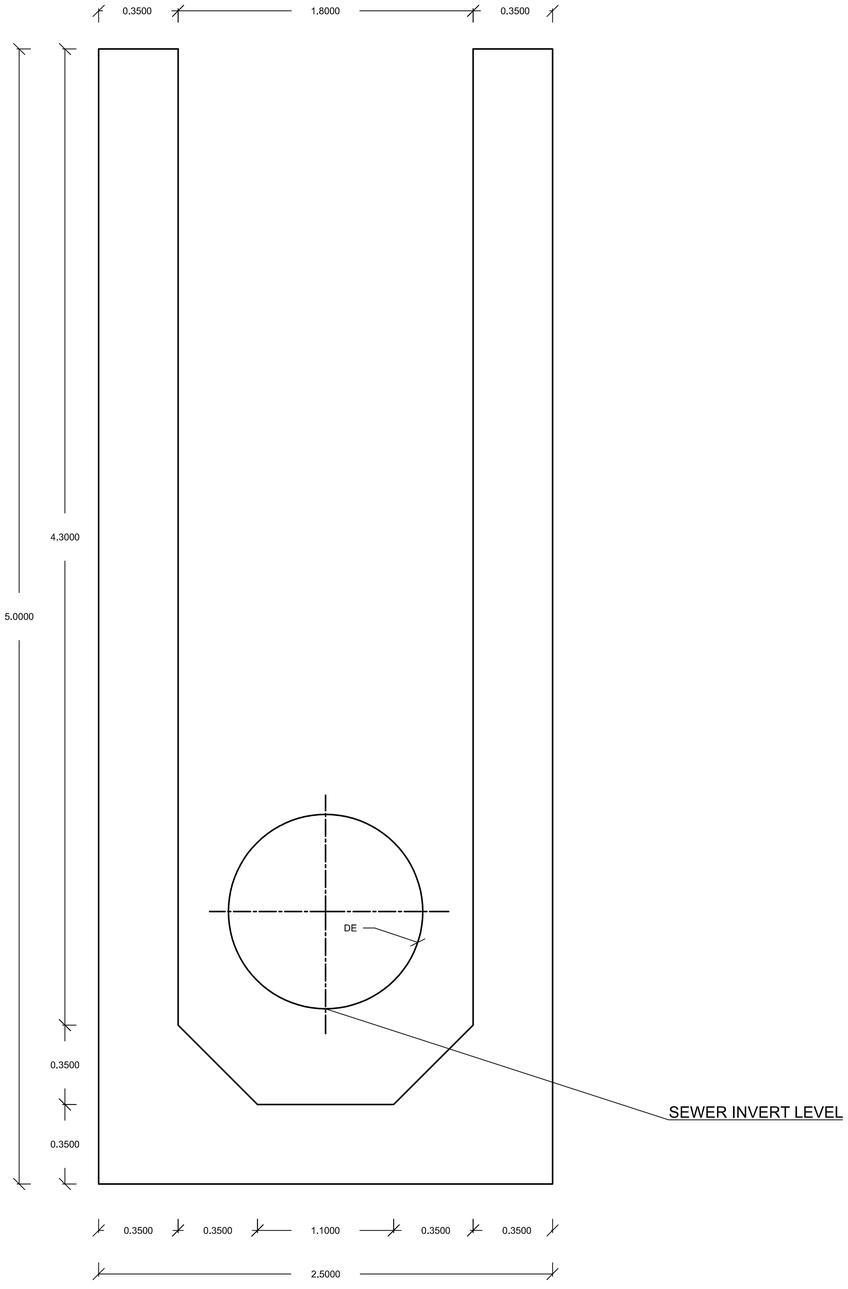
FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP10	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	10/11	451W–STDP10

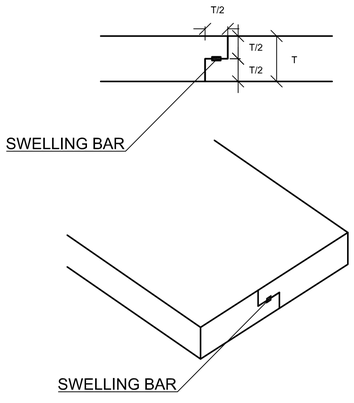
ORIGINAL DRAWING SIZE A1

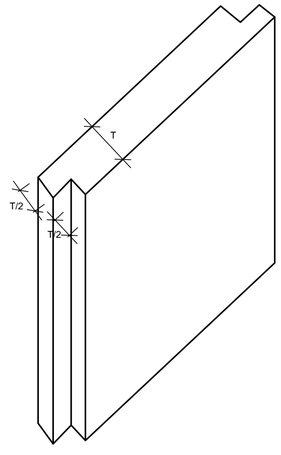


PRECAST CONCRETE STRUCYURE
H=5m – REINFORCEMENT DETAILS



PRECAST CONCRETE STRUCYURE
H=5m – REINFORCEMENT DETAILS





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STANDARD DRAWING	GENERAL DETAILS PIPE TRENCH DETAILS BELOW WATER TABLE

FILE	DESIGNED BY	DRAWN BY	CHECKED BY
451W–STDP09	A. ANIS	J. DAHER	M. RASSI

DATE	SCALE	SHEET No.	DRAWING No.
DECEMBER 2025	NOT TO SCALE	11/11	451W–STDP10

ORIGINAL DRAWING SIZE A1