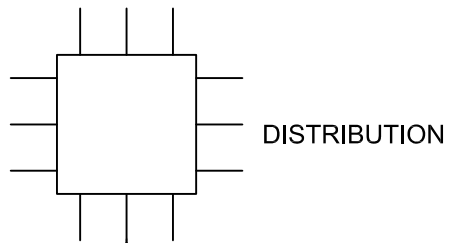
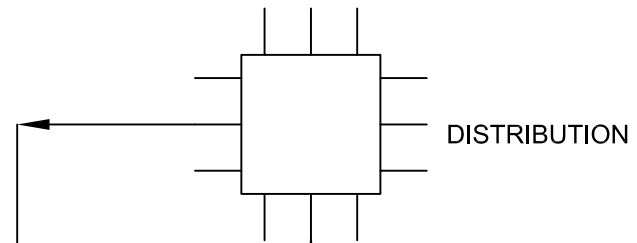


**Table of Contents**

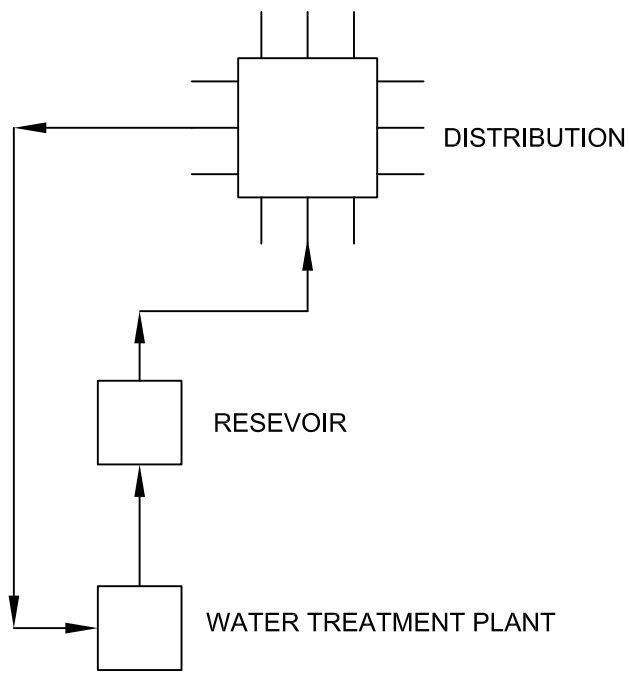
E-1	WATER DISTRIBUTION LOOPING.....	1
E-2	TYPICAL GATE VALVE INSTALLATION.....	2
E-3	TYPICAL FIRE HYDRANT ASSEMBLY.....	3
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LOOPING WITHOUT RETURN FLOW LINE IS NOT ACCEPTABLE



LOOPING WITH SHORT CIRCUIT RETURN LINE IS NOT ACCEPTABLE



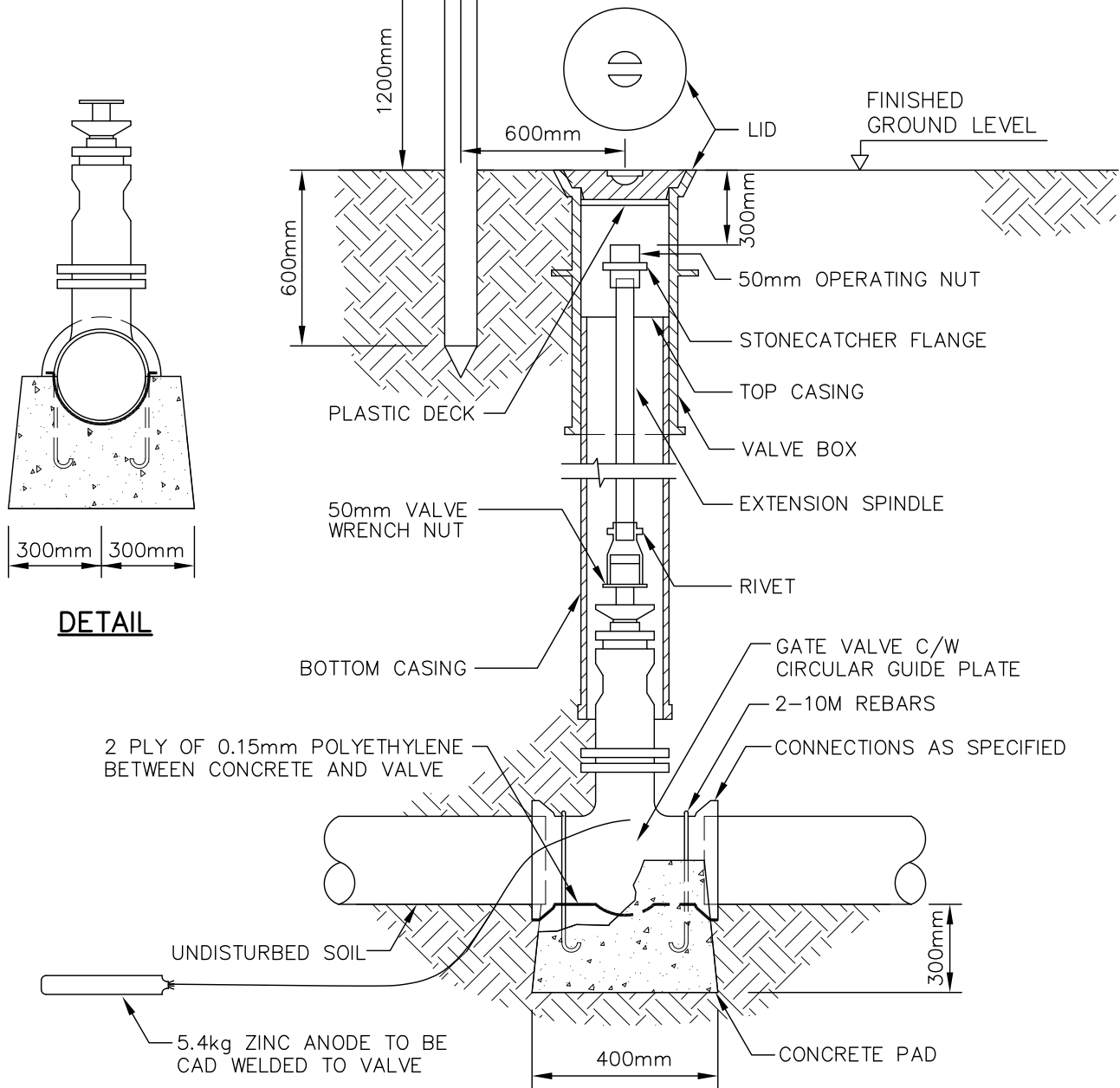
LOOPING WITH ACCEPTABLE RETURN FLOW LINE

I	04/04/17
REVISION	DATE



WATER DISTRIBUTION LOOPING		
SCALE NTS	DRAWN BY BMAIER	DRAWING NUMBER <b>E-1</b>
DATE APRIL 4, 2017		

100Øx1800 PRESSURE TREATED  
 MARKER POST – TOP 300  
 PAINTED WITH TWO COATS  
 BLUE PAINT

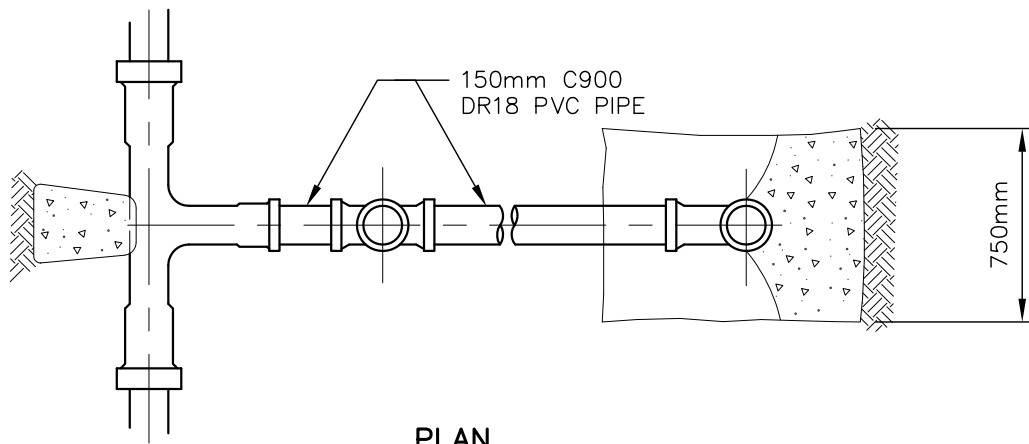


I	04/04/17
REVISION	DATE

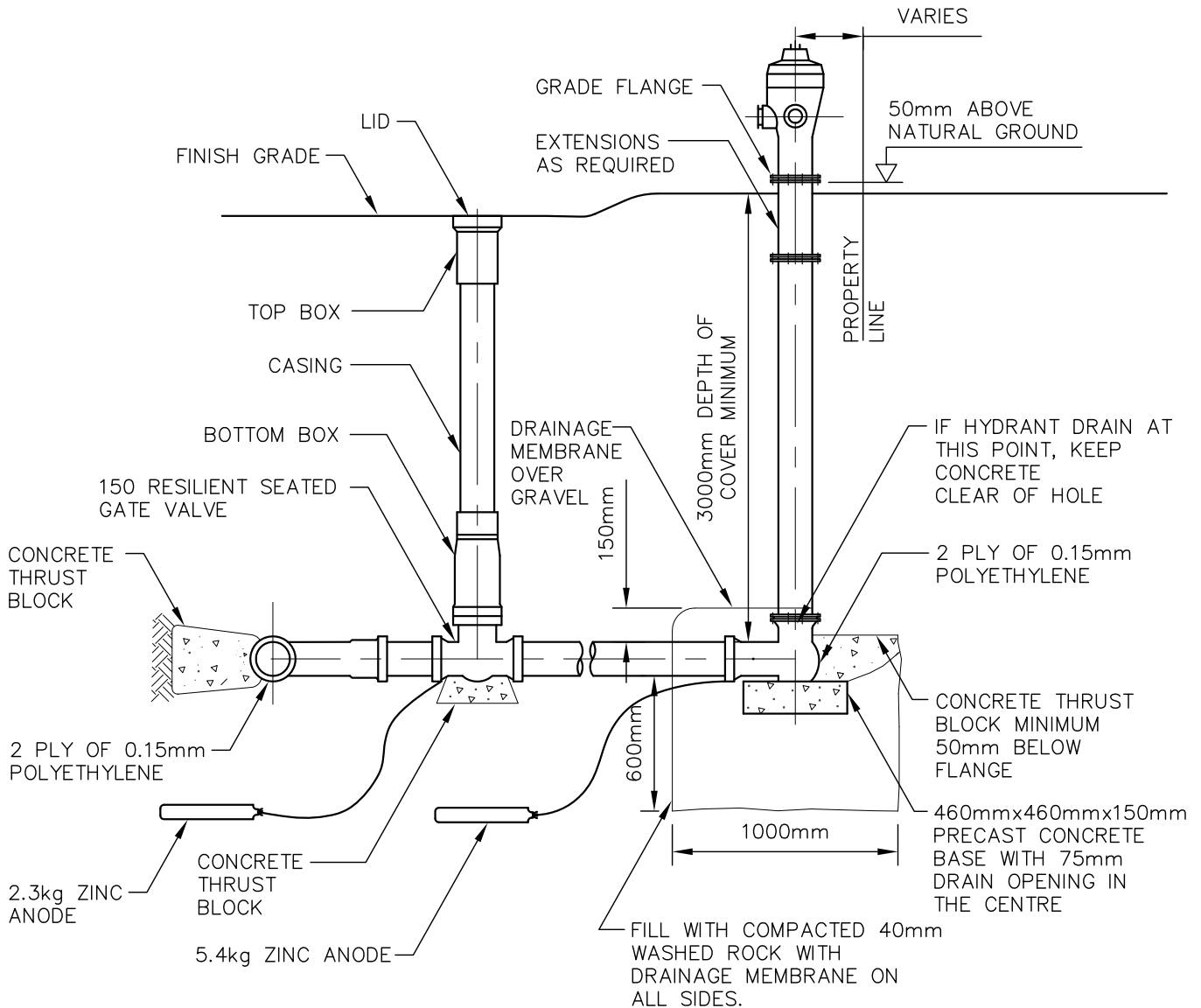


## TYPICAL GATE VALVE INSTALLATION

SCALE	NTS	DRAWN BY	BMAIER	DRAWING NUMBER <b>E-2</b>
DATE	APRIL 4, 2017			



**PLAN**



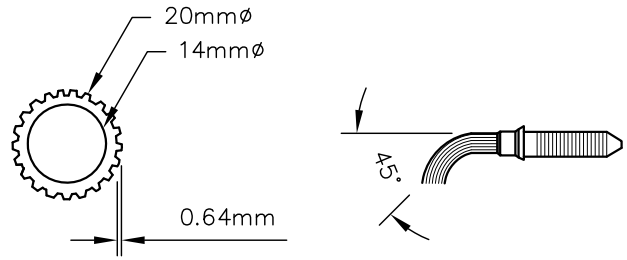
I	04/04/17
REVISION	DATE



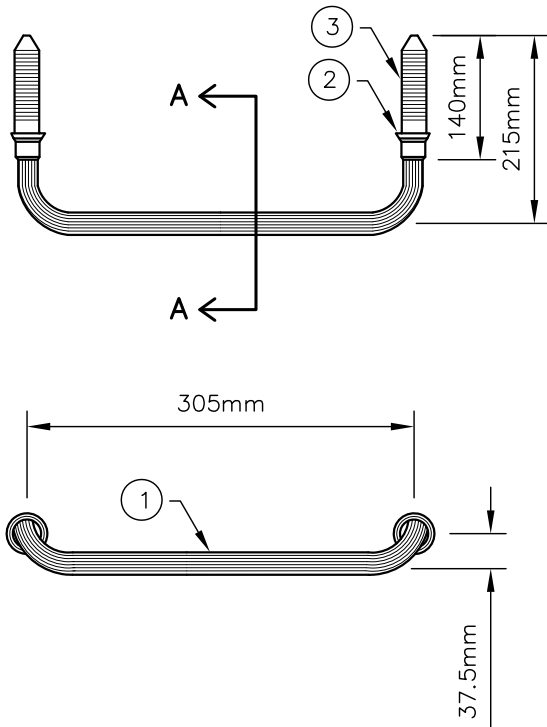
**TYPICAL FIRE HYDRANT ASSEMBLY**

SCALE	DRAWN BY
NTS	BMAIER
DATE	APRIL 4, 2017

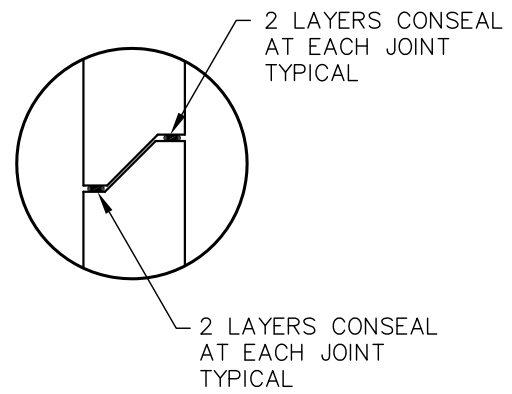
DRAWING  
NUMBER **E-3**



**SECTION A-A**



**RUNG DETAIL**



**JOINT DETAIL**

**MATERIAL SPECIFICATIONS**  
 ALUMINIUM TO CONFORM TO CAN3-S157-M83  
 STRENGTH DESIGN IN ALUMINIUM

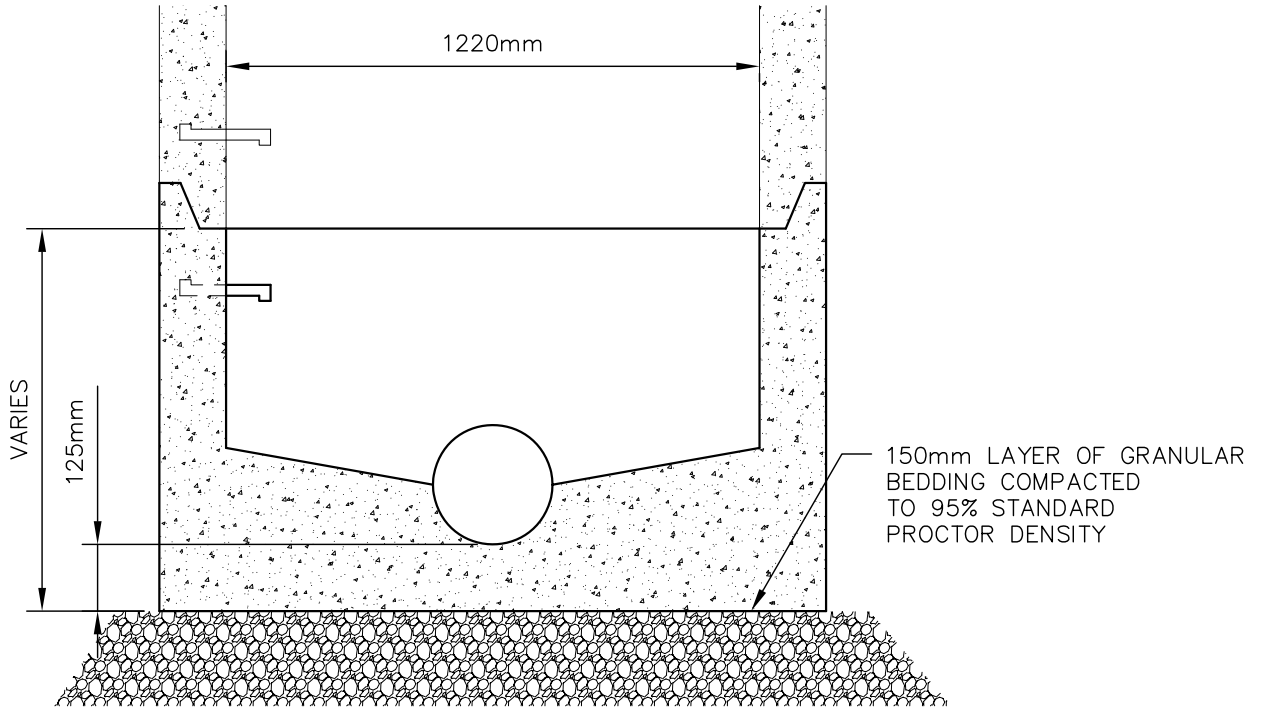
ITEM	QTY/ STEP	MATERIAL	DESCRIPTION
①	1	CS HA5 ALUM. 6351-T6	20 O.D. x 14 I.D. 6-8425 ALUMINIUM EXTRUSION
②	2	LOW DENSITY POLYETHYLENE	38.5 O.D. x 27.5 I.D. ADJUSTABLE COVERING ROSETTE
③	2	LOW DENSITY POLYETHYLENE	27.5 $\phi$ x 140 LG. ALL AROUND ANCHOR SLEEVE


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REVISION	DATE

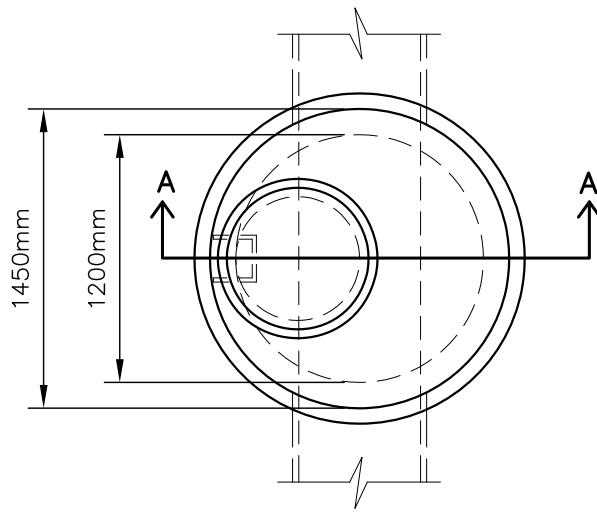


**STANDARD TYPE 5A PRECAST MANHOLE DETAILS**

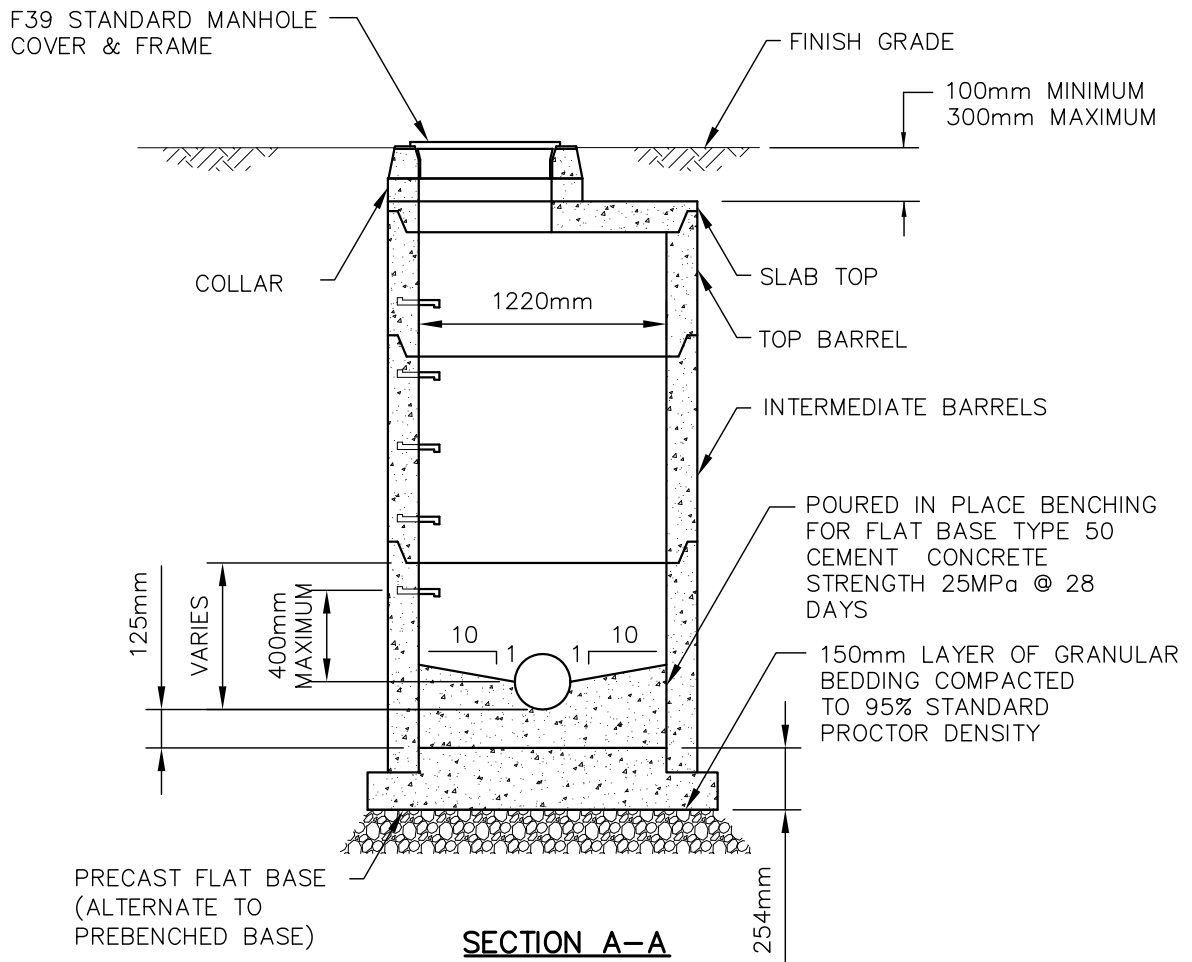
SCALE NTS	DRAWN BY BMAIER	DRAWING NUMBER <b>E-4</b>
DATE APRIL 5, 2017		



			STANDARD TYPE 5A PRECAST MANHOLE PREBENCHED BASE FOR 1200mm ASSEMBLY	
			SCALE NTS	DRAWN BY BMAIER
I	05/04/17		DATE APRIL 5, 2017	
REVISION	DATE			

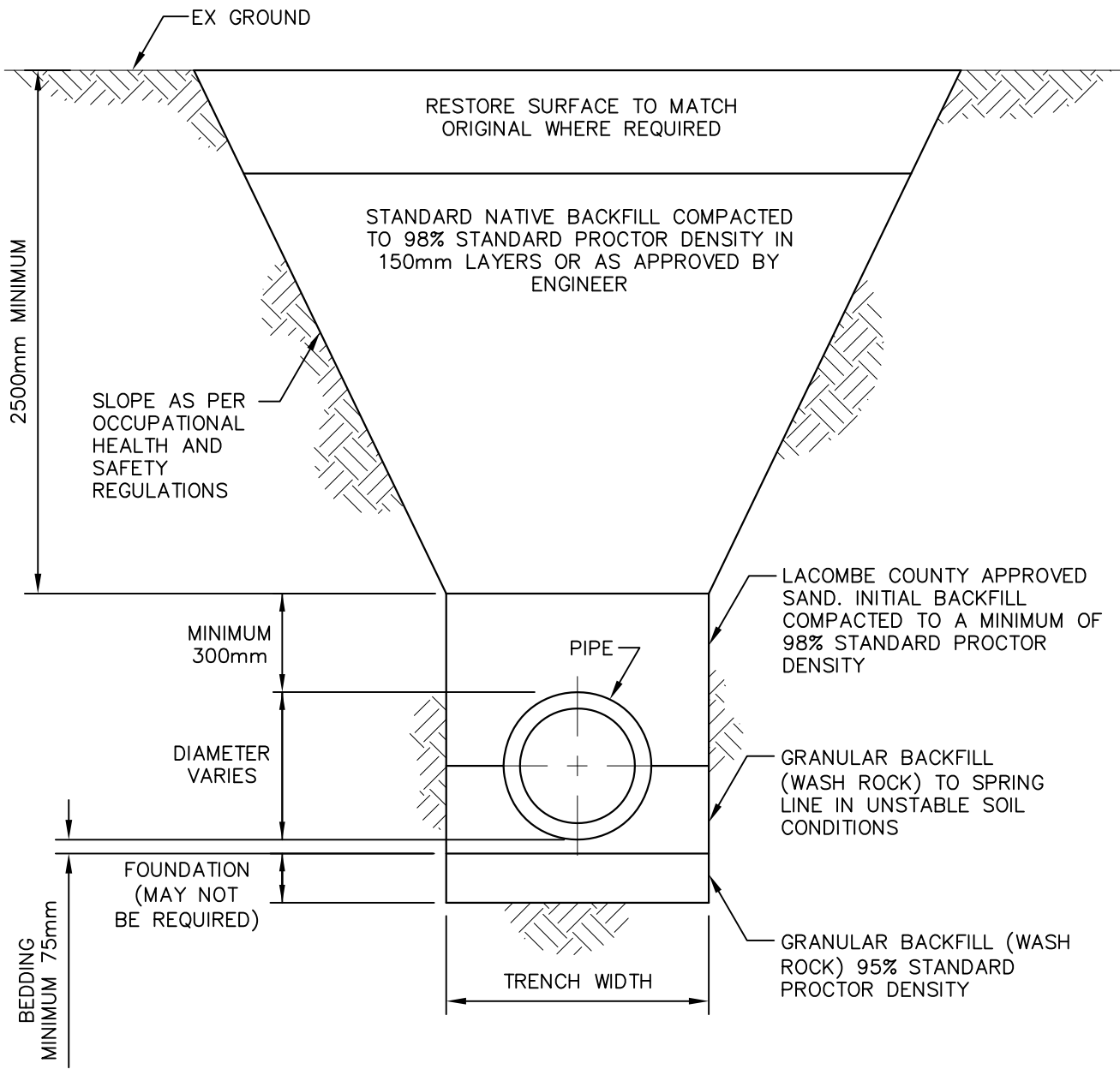


**PLAN**



**SECTION A-A**

			STANDARD TYPE 5A PRECAST MANHOLE PLAN AND SECTION	
			SCALE NTS	DRAWN BY BMAIER
I	05/04/17	DATE APRIL 5, 2017		DRAWING NUMBER <b>E-6</b>
REVISION	DATE			



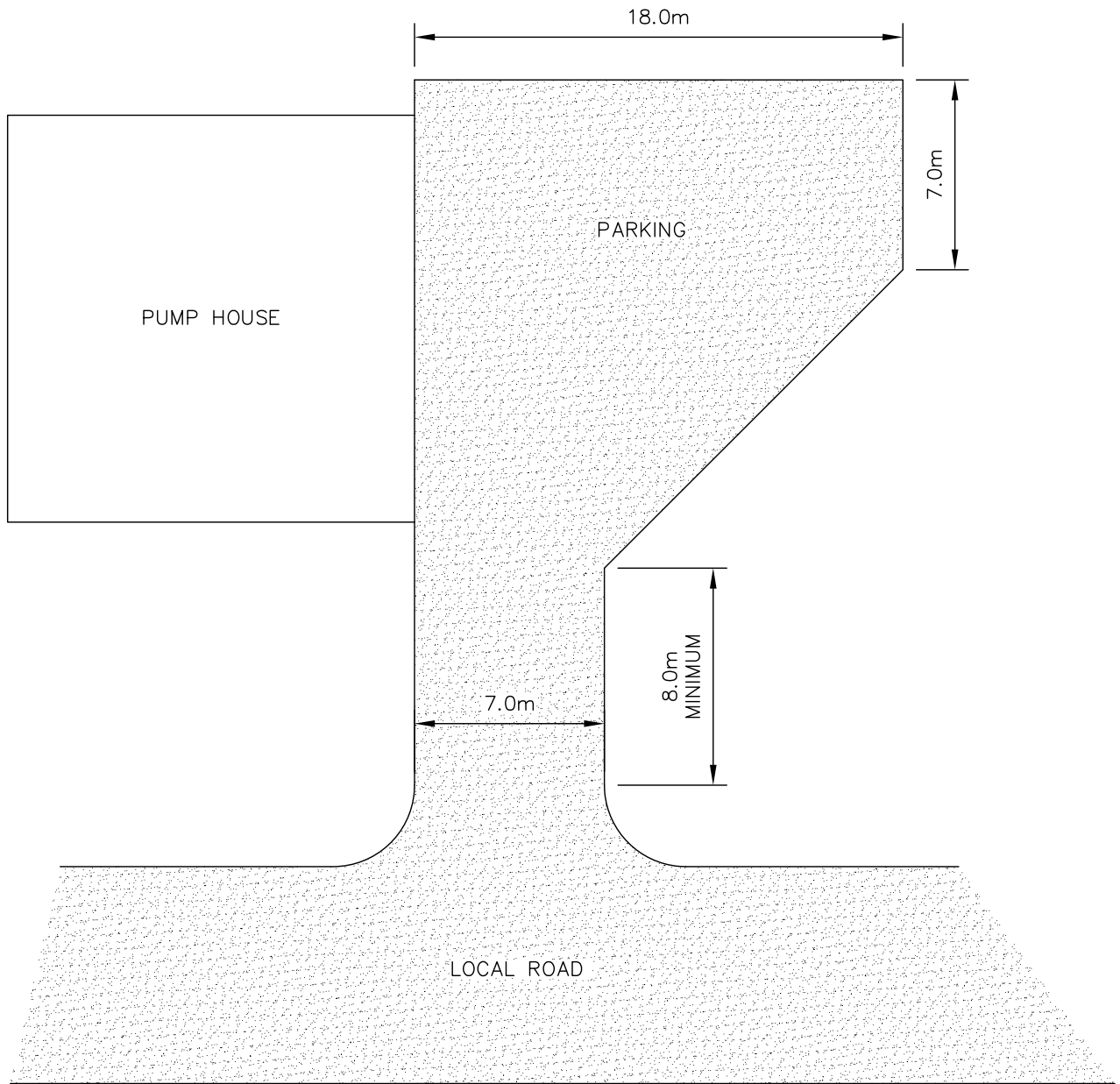
TRENCH WIDTH	
PIPE DIAMETER (mm)	MINIMUM TRENCH WIDTH
150 - 500	OD + 500
600 AND LARGER	OD x 1.5
OD = OUTSIDE DIAMETER	

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TYPICAL TRENCH BEDDING AND TRENCH BACKFILL		
SCALE	DRAWN BY	DRAWING NUMBER <b>E-7</b>
NTS	BMAIER	
DATE	APRIL 6, 2017	





I	06/04/17
REVISION	DATE



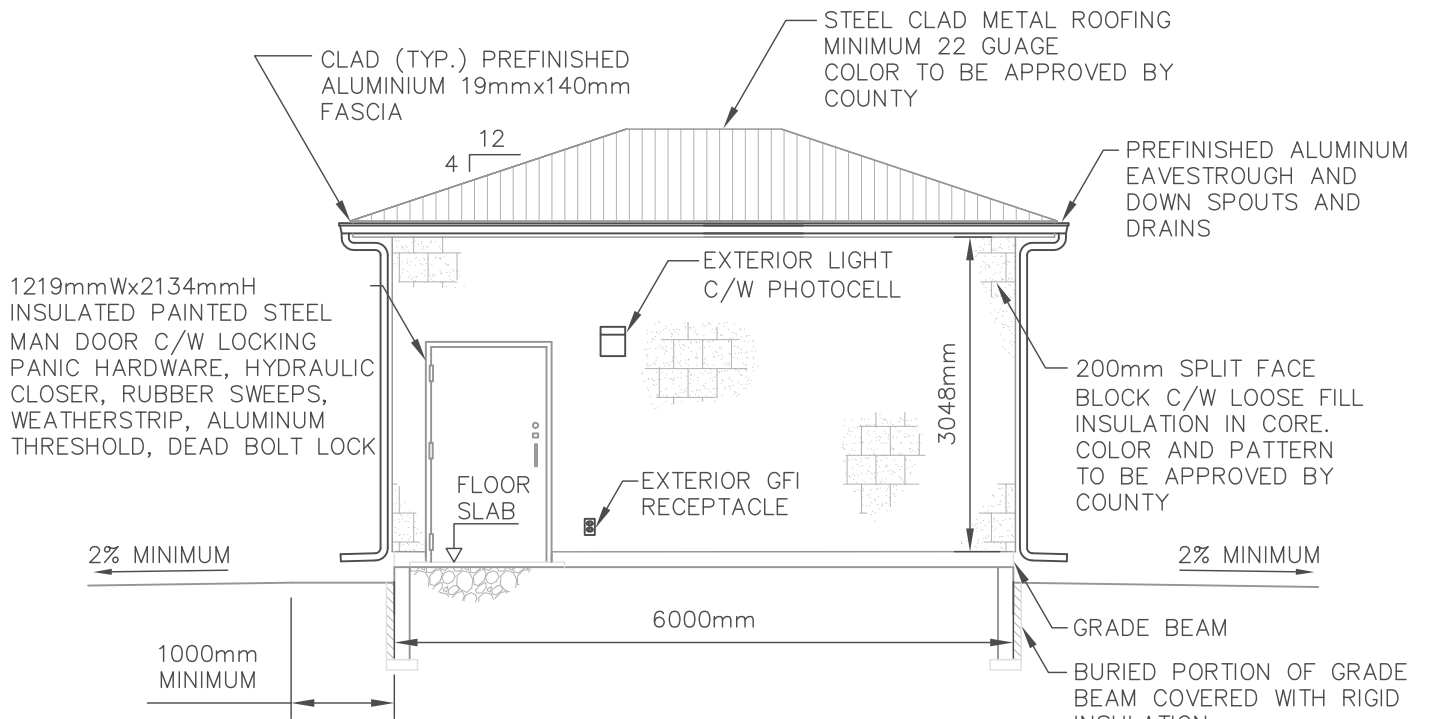
TYPICAL WATER PUMPHOUSE PARKING AREA

SCALE NTS

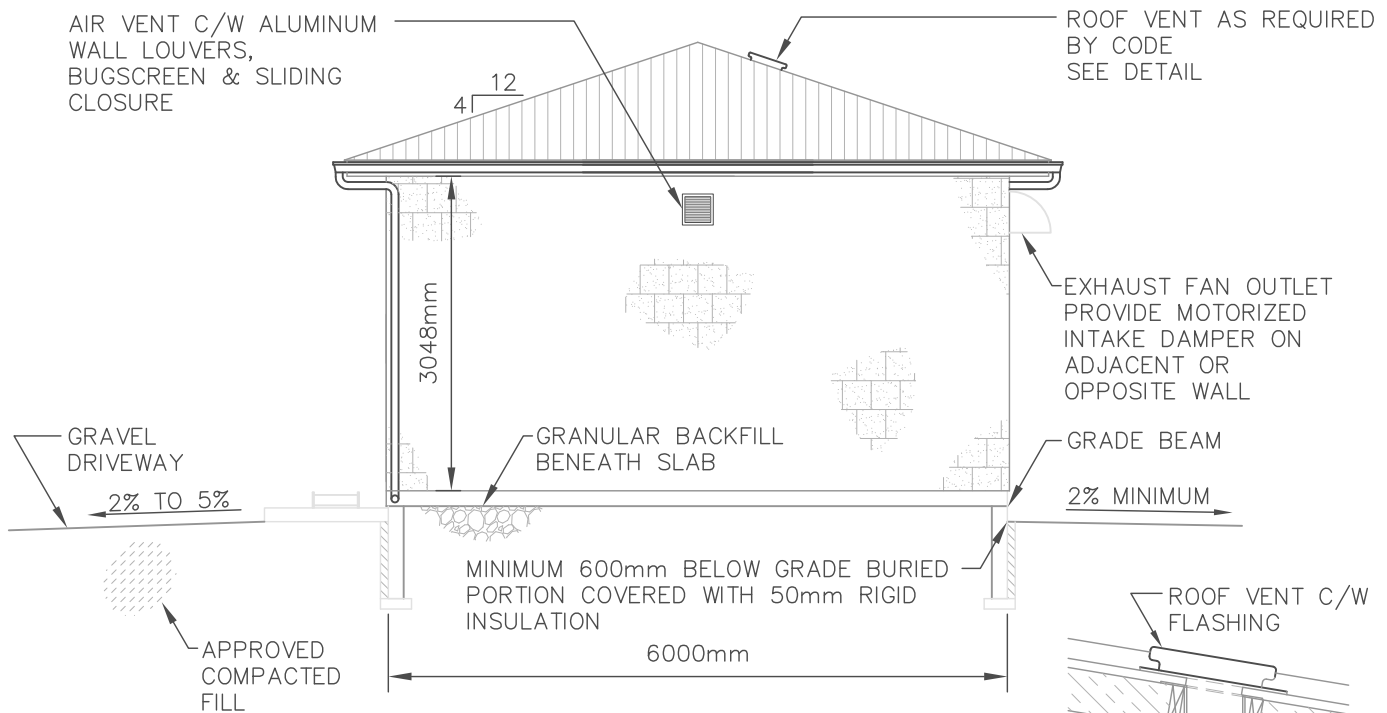
DRAWN BY BMAIER

DATE APRIL 6, 2017

DRAWING NUMBER **E-8**



**FRONT ELEVATION**

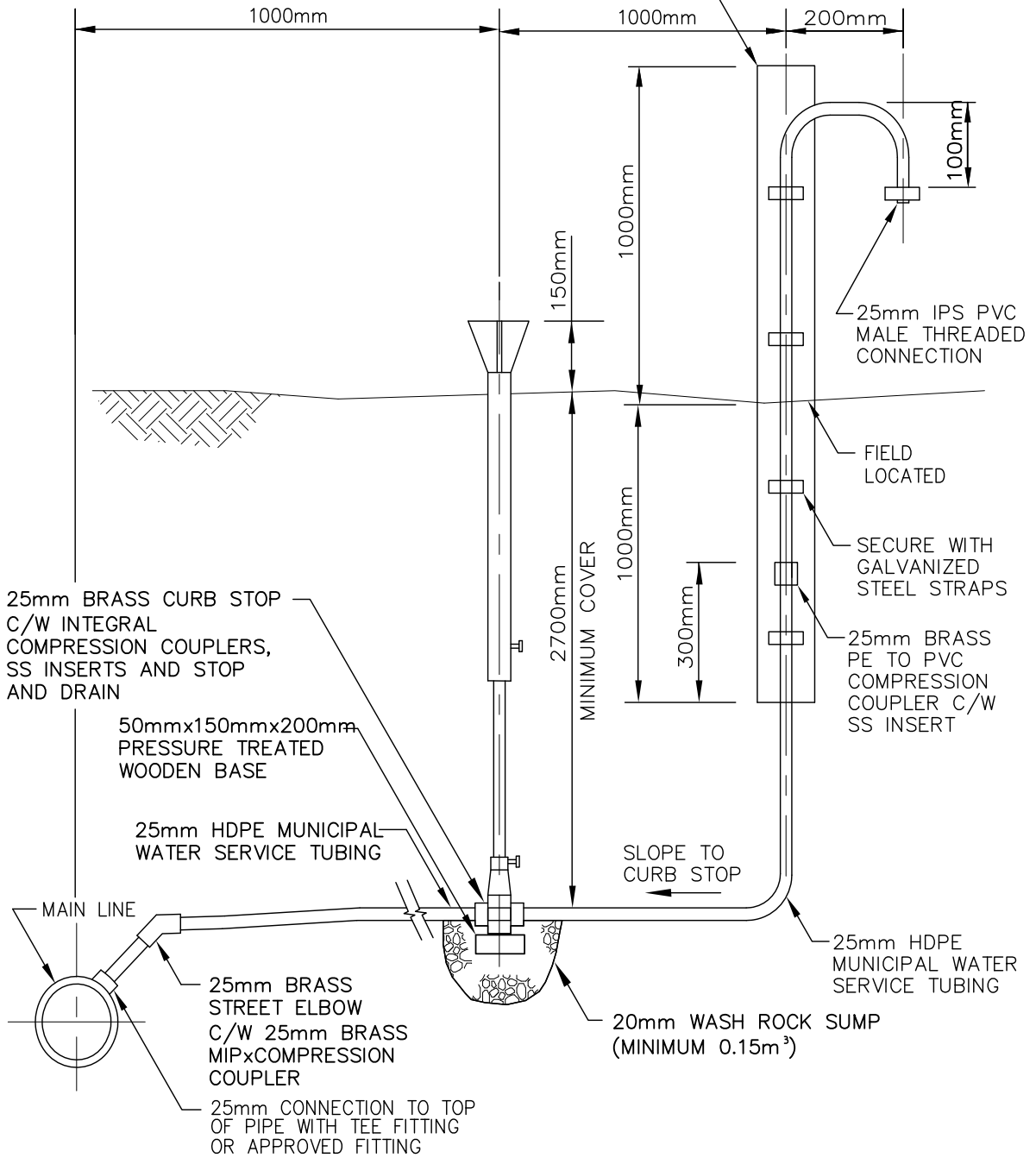


**SIDE ELEVATION**

**DETAIL**

			TYPICAL WATER PUMPHOUSE BUILDING ELEVATIONS	
I	06/04/17		SCALE NTS	DRAWN BY BMAIER
REVISION	DATE		DATE APRIL 6, 2017	DRAWING NUMBER <b>E-9</b>

100mmX100mm PRESSURE TREATED POST C/W 2 COATS OF PAINT (COLOR DETERMINED BY OWNER)



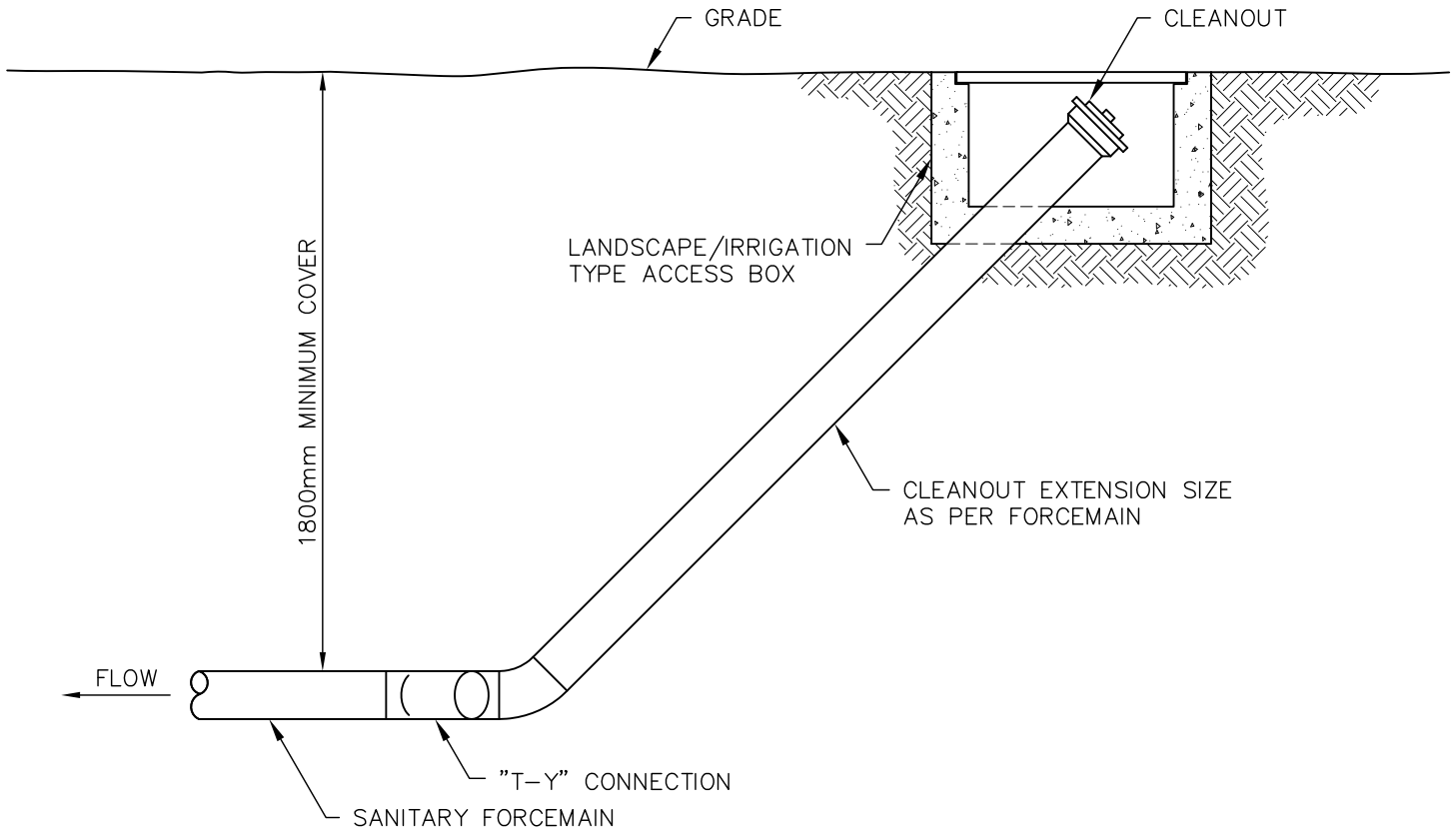
**NOTES:**

1. ABOVE GROUND PIPE TO BE SCHEDULE 40 PVC.
2. ALL FITTINGS AND PIPE TO MATCH OR EXCEED PRESSURE RATING OF MAIN LINE.

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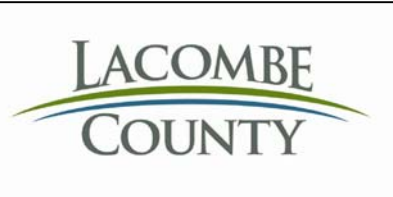
<b>FLUSHING ASSEMBLY DETAIL</b>		
SCALE	DRAWN BY	<b>E-10</b>
NTS	BMAIER	
DATE	APRIL 6, 2017	
	DRAWING NUMBER	



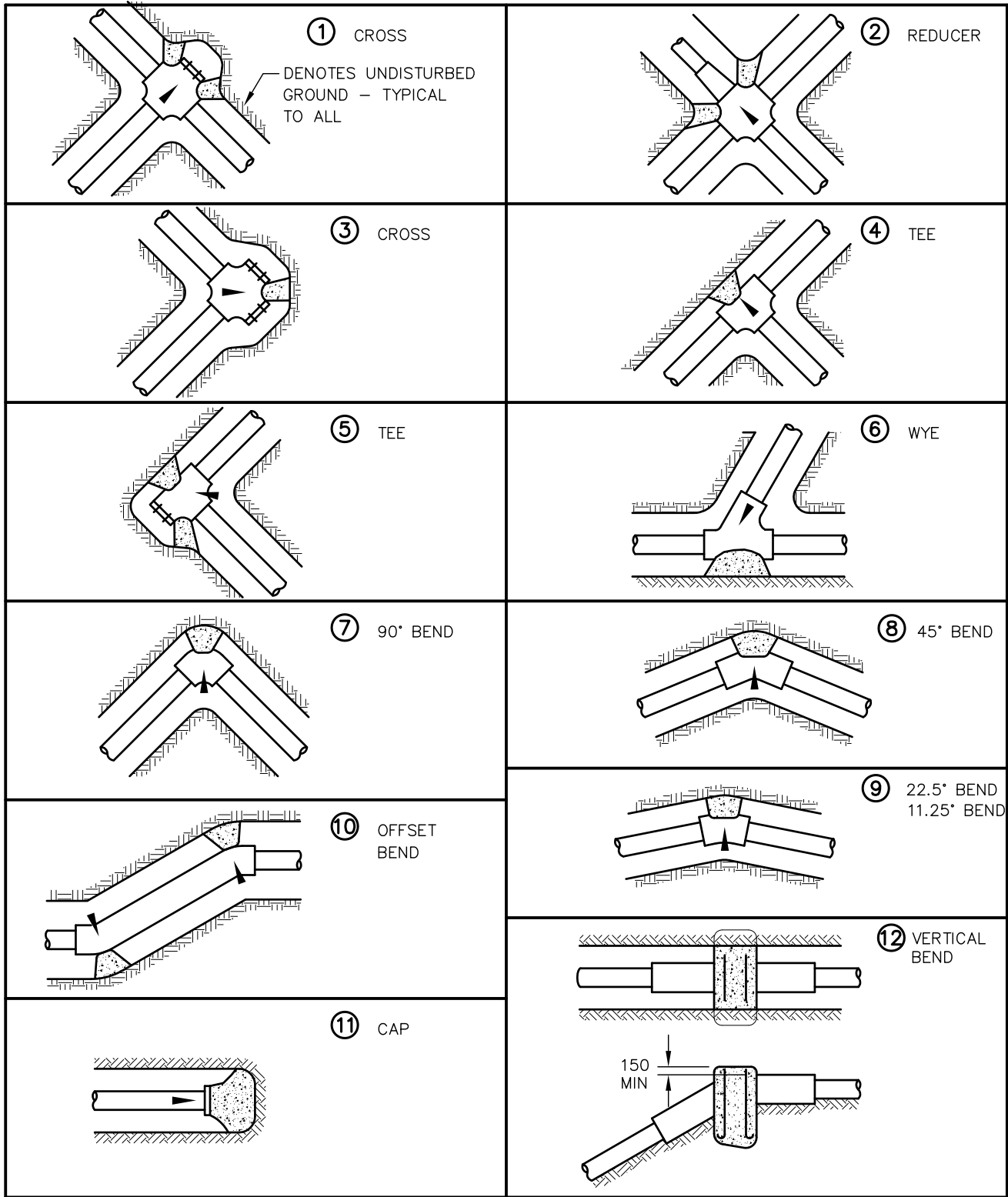
**NOTES:**

1. PROVIDE CLEANOUT AT EACH CHANGE IN THE FORCEMAIN AND ON ALL STRAIGHT RUNS OVER 30m.
2. PROVIDE THRUST BLOCKS AT EACH CHANGE IN DIRECTION AS PER DETAIL.

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SANITARY FORCEMAIN CLEANOUT DETAIL		
SCALE	DRAWN BY	E-11
NTS	BMAIER	
DATE	APRIL 6, 2017	



NOTE:  
REFER TO THRUST BLOCK DATA DRAWING FOR  
THRUST BLOCK SIZES

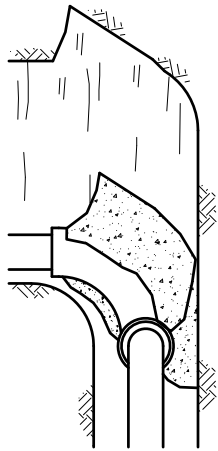
I	07/04/17
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## WATERMAIN THRUST BLOCK LOCATIONS

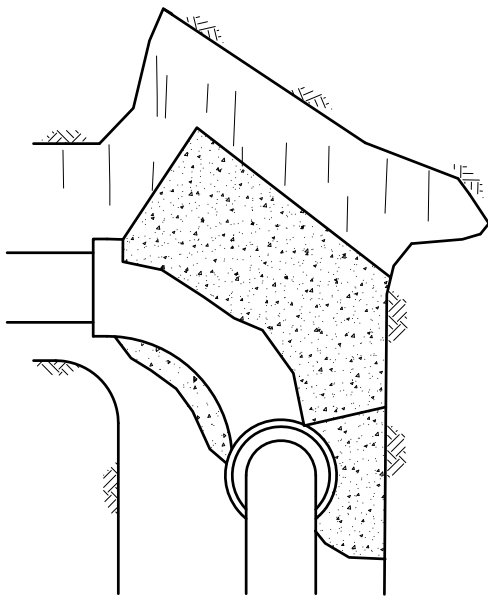
SCALE	DRAWN BY
NTS	BMAIER
DATE	APRIL 7, 2017

DRAWING NUMBER **E-12**



**FOR SMALL PIPES**

TABLE 'A'					
THRUST AT FITTINGS FOR 100 LBS PER SQ. IN.					
PIPE SIZE IMPERIAL	PIPE SIZE METRIC	DEAD END OR TEE	90° BEND	45° BEND	22.5° BEND
4"	100	1,400	2,030	1,100	600
6"	150	3,100	4,400	2,400	1,200
8"	200	5,300	7,500	4,100	2,100
10"	250	8,200	11,600	6,300	3,200
12"	300	11,600	16,300	8,800	4,500
14"	350	13,900	19,700	10,700	5,400
16"	400	18,200	25,700	13,900	7,100
18"	450	23,000	32,600	17,600	9,000
20"	500	28,400	40,200	21,800	11,100
24"	600	40,900	57,900	31,300	16,000



**FOR LARGE PIPES**

TABLE 'B'	
SOIL TYPE	SAFE BEARING LOAD LBS. PER SQ. FOOT
SOFT CLAY	1,000
FIRM CLAY	1,500
DENSE CLAY TILL	3,000
DENSE SILT	1,500
LOOSE SAND	1,000
DENSE SAND	2,000
GRAVEL	3,000
SHALE OR SANDSTONE BEDROCK	10,000

THE SAFE BEARING LOADS IN TABLE 'B' ARE FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FT. (600mm).

**NOTE:**

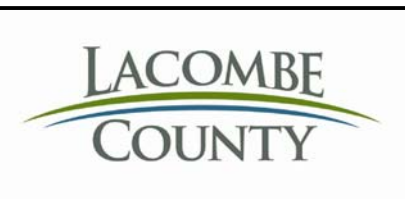
TO DETERMINE THE BEARING AREA FOR VARIOUS SOIL CONDITIONS DIVIDE THE VALUES FOUND IN TABLE 'A' BY THOSE IN TABLE 'B'

ie. A 6"-90° BEND TO BE LAID IN A FIRM CLAY TRENCH WILL REQUIRE A BEARING AREA THUS:

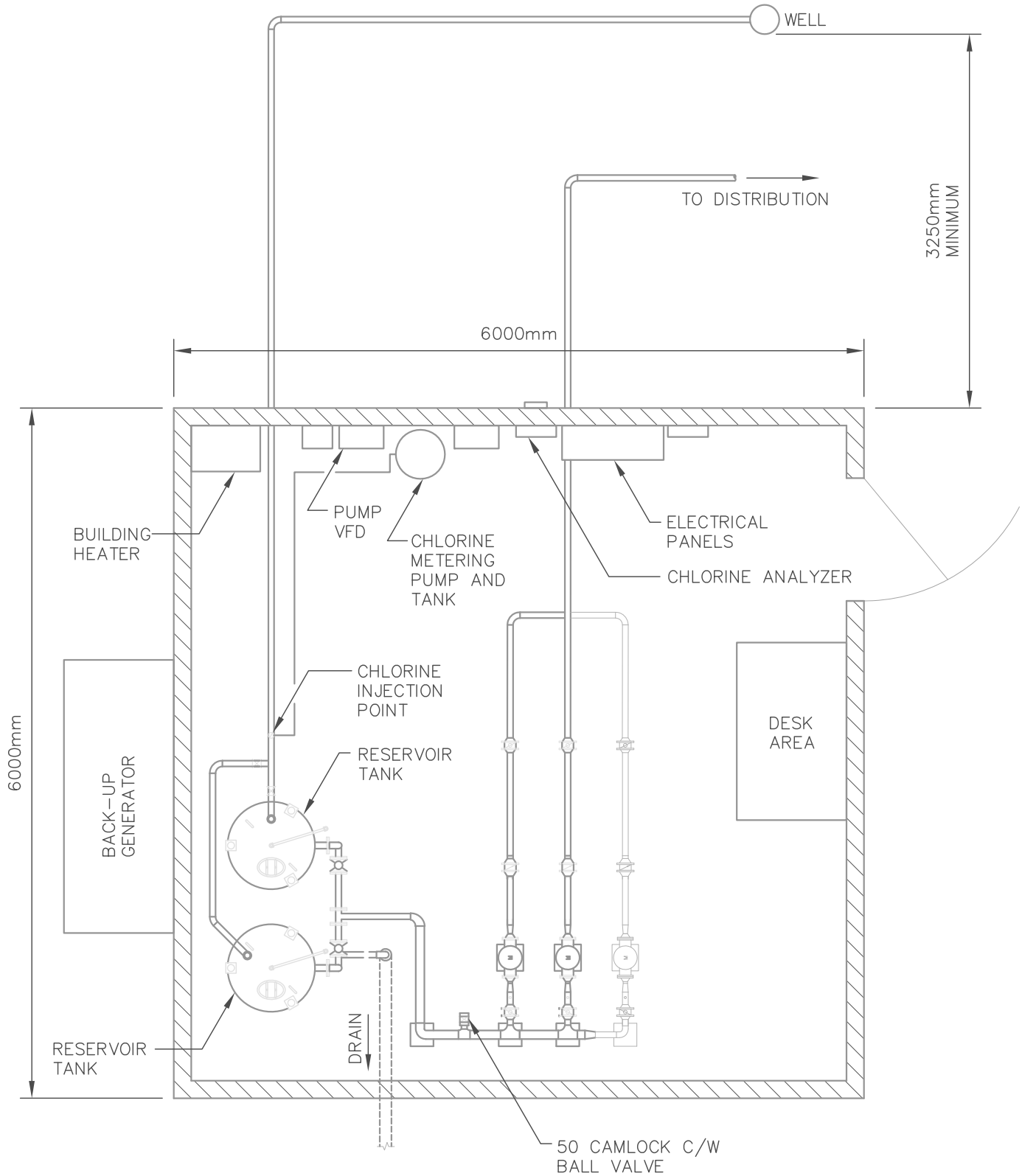
$$\frac{4,400}{1,500} = 2.9 \text{ SQ. FT.}$$

FOR PIPE SIZES LESS THAN 100mm, VALUES CALCULATED FOR 100mm PIPE SHALL BE USED.

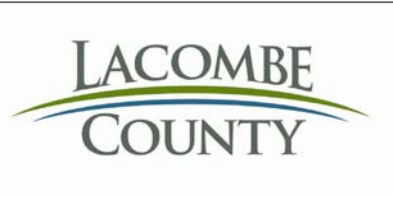
I	07/04/17
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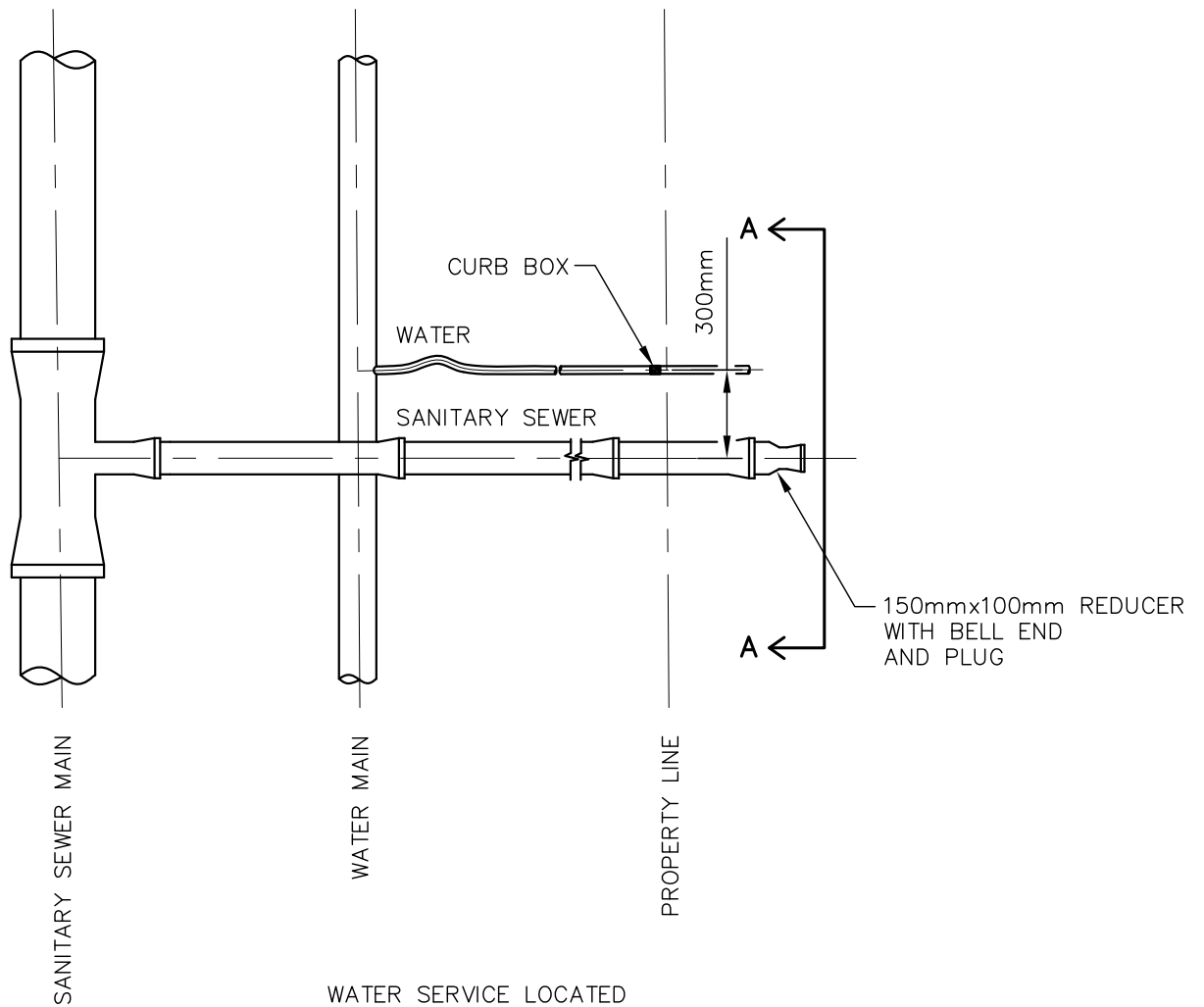
WATERMAIN THRUST BLOCK DATA		
SCALE NTS	DRAWN BY BMAIER	DRAWING NUMBER <b>E-13</b>
DATE APRIL 7, 2017		



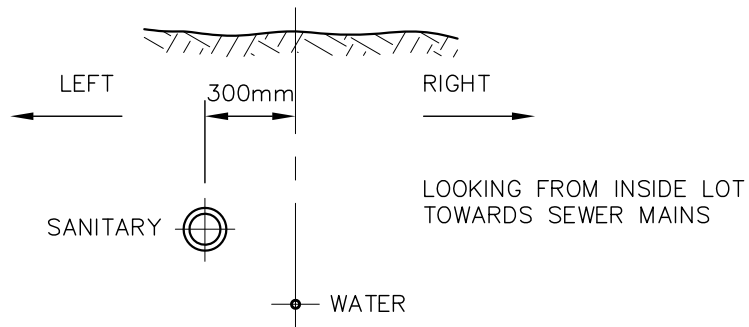
I	07/04/17
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TYPICAL WATER PUMPHOUSE LAYOUT		
SCALE	DRAWN BY	DRAWING NUMBER
NTS	BMAIER	
DATE	APRIL 7, 2017	<b>E-14</b>



WATER SERVICE LOCATED AT LEAST 0.5m FROM DRIVEWAY



**SECTION A-A**

I	07/04/17
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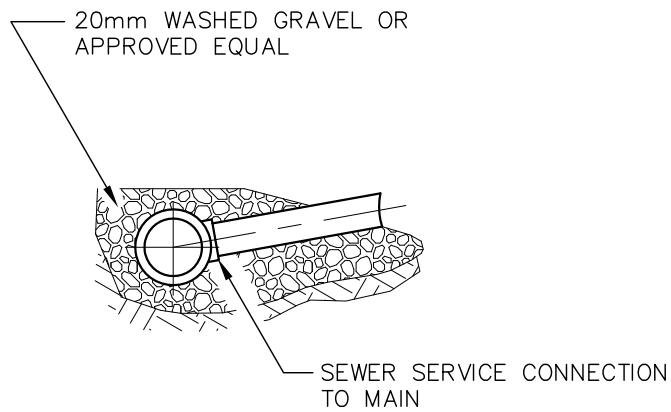
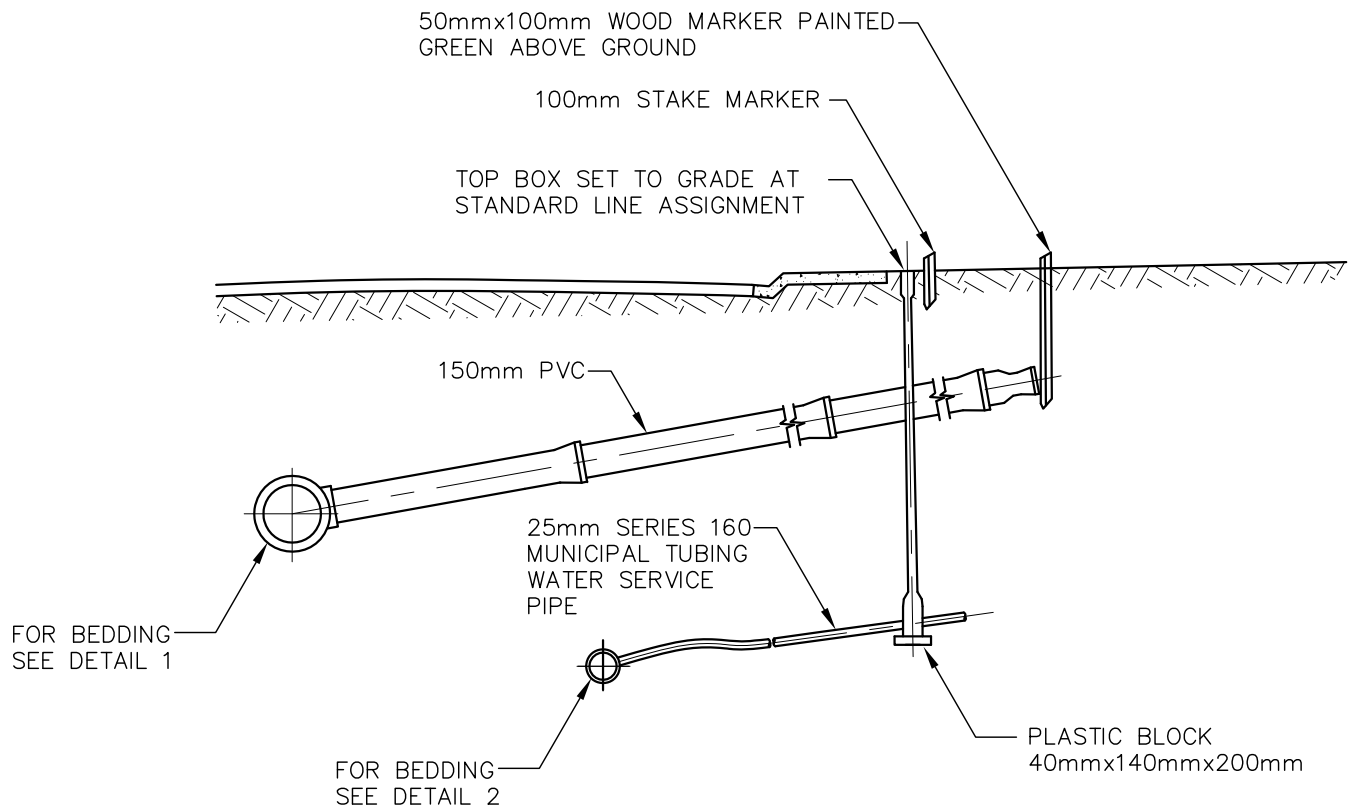


SERVICE CONNECTION WITH GRAVITY SANITARY SYSTEM TYPICAL LAYOUT

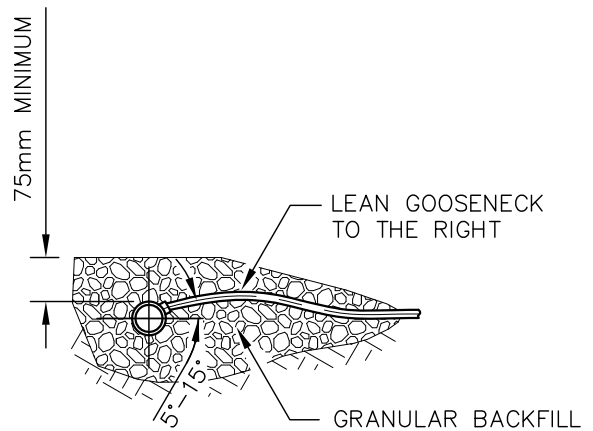
SCALE	DRAWN BY
NTS	BMAIER
DATE	APRIL 7, 2017

DRAWING NUMBER **E-15**





**DETAIL 1**

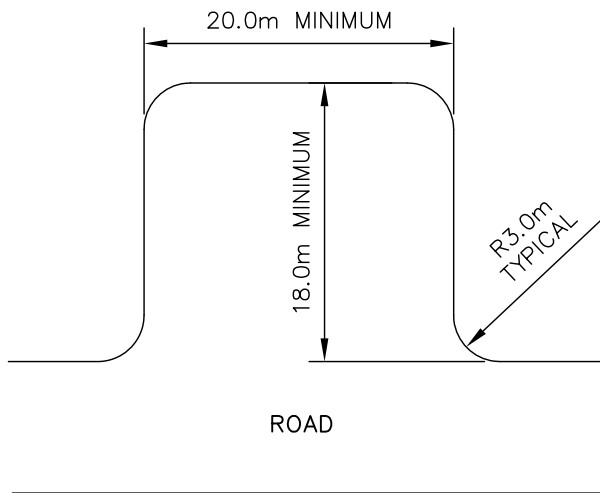


**DETAIL 2**

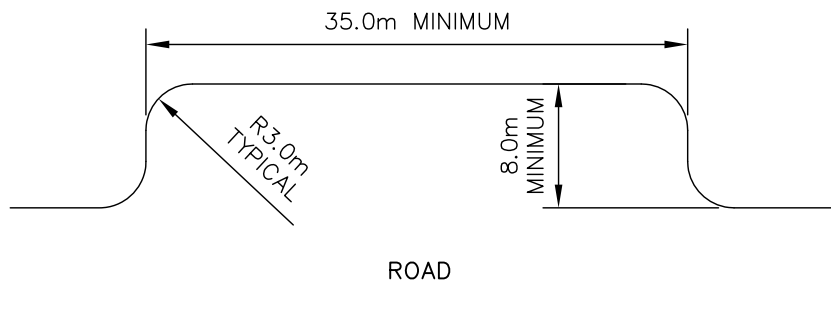
I	07/04/17
REVISION	DATE



SERVICE CONNECTION WITH GRAVITY SANITARY SYSTEM DETAILS		
SCALE	DRAWN BY	DRAWING NUMBER
NTS	BMAIER	
DATE	APRIL 7, 2017	<b>E-16</b>



PULL-OUT AREA



DRIVE-THROUGH AREA

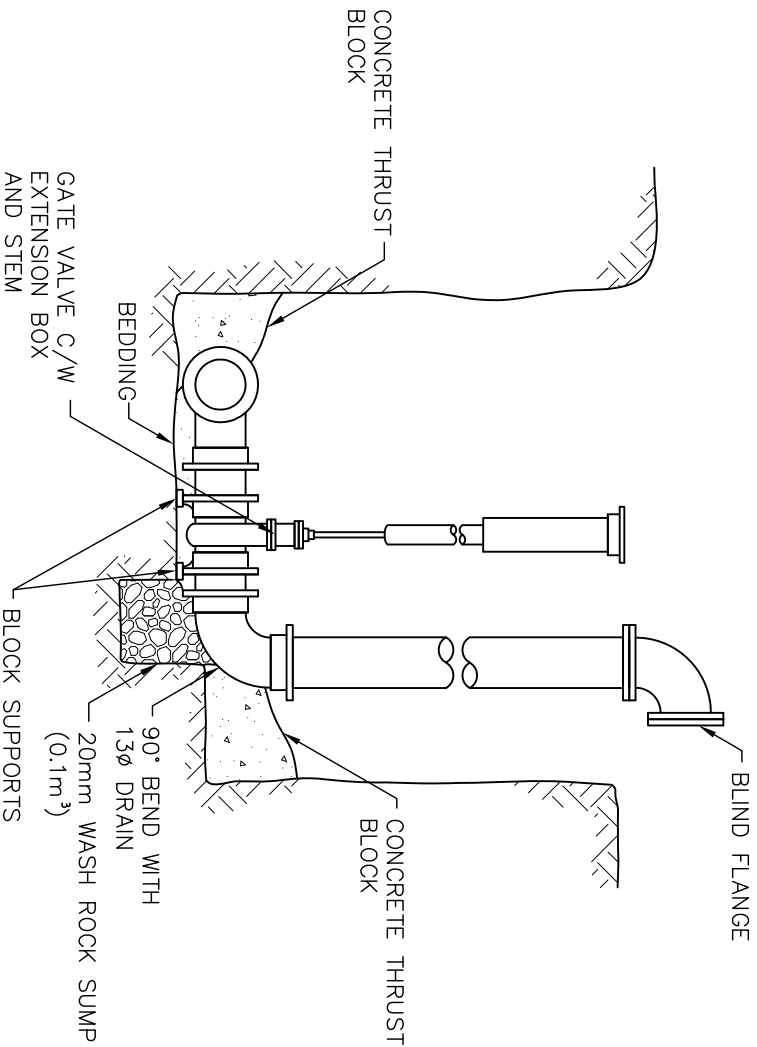
I	07/04/17
REVISION	DATE



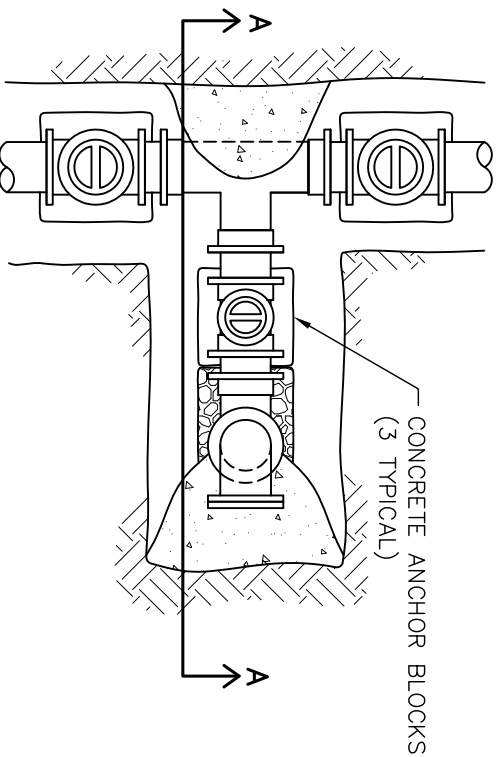
TYPICAL SANITARY LOADING AREA

SCALE	DRAWN BY
NTS	BMAIER
DATE	APRIL 7, 2017

DRAWING NUMBER **E-17**



**SECTION A-A**



**PLAN**

REVISION	DATE
1	07/14/17

**SEWAGE FOREREMAN FLUSHOUT DETAILS**

PROJECT NUMBER

DRAWN BY

BMAIER

SCALE

NTS

DATE

APRIL 7, 2017

DRAWING NUMBER

**E-18**