

NOTES:

1. THIS INFORMATION SHOULD BE USED AS GUIDANCE MATERIAL ONLY. DEFINITIVE ASSESSMENT OF NATIVE SOIL AHBP CAN BE OBTAINED THROUGH SPECIALIST GEOTECHNICAL ADVICE (REFER TO SECTION 7.5.1 OF WSA03).
2. NATIVE SOIL STRENGTH HAS SIGNIFICANCE IN THE DESIGN OF THE FOLLOWING ATTRIBUTES:
 - a. PIPELINE MATERIAL SELECTION (eg. WEAKER GROUND CONDITIONS REQUIRED RESTRAINED JOINTS AND/OR STIFFER PIPES WITH GREATER HOOP / FLEXURAL STRENGTH)
 - b. EMBEDMENT & BACKFILL DESIGN (eg. WEAKER GROUND MAY LEAD TO THE PIPELINE REQUIRING ADDITIONAL SUPPORT)
 - c. THRUST RESTRAINT DESIGN (eg. UNRESTRAINED JOINTS ARE NOT ACCEPTABLE IN POOR GROUND CONDITIONS)

PREPARING THE TEST AREA:

CONDUCT ALL NATIVE SOIL IDENTIFICATION TESTS ON A FRESHLY EXPOSED, DAMP, HAND- TRIMMED AREA OF THE TRENCH WALL IN THE PIPE ZONE. TAKE CARE THAT THE SOIL IN THE EXPOSED TEST AREA IS NOT COMPACTED OR LOOSENED DURING TRENCH EXCAVATION. IF THE SOIL IN THE TRENCH FLOOR AND WALL IS VERY DRY AT THE TIME THE TRENCH IS OPENED THEN FLOOD THE TEST AREA AND ALLOW TIME FOR THE WATER TO BE ABSORBED BY THE SOIL BEFORE IT IS TRIMMED AND TESTED.

IDENTIFYING CLAY SOILS:

A LUMP OF CLAY SOIL WILL BE DIFFICULT TO BREAK WHEN DRY. IT WILL BE STICKY AND NEED SOME EFFORT TO MOULD WITH THE FINGERS WHEN WET. CLAY WILL NOT WASH OFF EASILY. INDIVIDUAL CLAY PARTICLES ARE HARD TO SEE.

TESTING CLAY SOILS:

CLAY SOILS ARE BEST TESTED IN THE WALL OF THE TRENCH. THE FIST, THE THUMB OR THE THUMBNAIL ARE USED TO DETERMINE THE CONSISTENCY (STRENGTH) OF THE CLAY (SEE TABLE.)

IDENTIFYING CLEAN SAND SOILS:

THE INDIVIDUAL GRAINS OF SAND WILL BE VISIBLE TO THE EYE. A LUMP OF CLEAN SAND, IF IT CAN BE PICKED UP AT ALL, WILL CRUMBLE WITH VERY LITTLE EFFORT. CLEAN SAND WASHES OFF EASILY.

TESTING CLEAN SAND SOILS:

CLEAN SAND SOILS ARE BEST TESTED IN THE FLOOR OF THE TRENCH BY PUSHING WITH THE WHOLE BODY WEIGHT ON ONE FOOT. THE DEPTH OF THE DEPRESSION LEFT BY THE BOOT IS RELATED TO THE DENSITY OF THE SAND (SEE TABLE). TAKE CARE TO ENSURE THAT THE SAND IN THE TRENCH FLOOR WAS NOT COMPACTED OR LOOSENED DURING THE EXCAVATION OF THE TRENCH OR THE TRIMMING OF THE TEST AREA.

TESTING ROCK:

THE RECOMMENDED FIELD IDENTIFICATION TESTS FOR ROCK RELY ON OBSERVING THE EASE WITH WHICH THE ROCK CAN BE DUG WITH A PICK, AND ESTIMATING THE SPACING OF THE JOINTS IN THE ROCK. (JOINTS ARE COMMONLY CALLED CRACKS OR BREAKS). THE SPACING BETWEEN JOINTS IS IMPORTANT BECAUSE THE ALLOWABLE BEARING PRESSURE ON ROCK IS USUALLY CONTROLLED BY THE JOINTS IN IT, RATHER THAN THE INHERENT STRENGTH OF A FRAGMENT OF ROCK. JOINTS MAY BE TIGHTLY CLOSED (LIKE HAIRLINE CRACKS), BUT CAN ALSO BE OPEN (FILLED WITH AIR) OR FILLED WITH SOFT CLAY OR OTHER SOIL.

SOIL CLASSIFICATION		FIELD IDENTIFICATION TEST	AHBP kPa ▲
CLAY SOILS	VERY SOFT	EASILY PENETRATED 40 mm WITH FIST.	< 50 *
	SOFT	EASILY PENETRATED 40 mm WITH THUMB.	< 50 *
	FIRM	MODERATE EFFORT NEEDED TO PENETRATE 30 mm WITH THUMB.	< 50 *
	STIFF	READILY INDENTED WITH THUMB BUT PENETRATED ONLY WITH GREAT EFFORT.	50
	VERY STIFF	READILY INDENTED WITH THUMBNAIL.	100
	HARD	INDENTED WITH DIFFICULTY BY THUMBNAIL.	200
SANDS	LOOSE CLEAN SAND	TAKES FOOTPRINT MORE THAN 10 mm DEEP.	< 50 *
	MEDIUM-DENSE CLEAN SAND	TAKES FOOTPRINT 3 mm TO 10 mm DEEP.	50
	DENSE CLEAN SAND OR GRAVEL	TAKES FOOTPRINT LESS THAN 3 mm DEEP.	100
ROCK	BROKEN OR DECOMPOSED ROCK	DIGGABLE. HAMMER BLOW "THUDS". JOINTS (BREAKS IN ROCK) SPACED AT LESS THAN 300 mm APART.	100
	SOUND ROCK	NOT DIGGABLE WITH PICK. HAMMER BLOW "RINGS" JOINTS (BREAK IN ROCK) SPACED MORE THAN 300 mm APART.	200
UNCOMPACTED FILL REFUSE (TIP)		OBSERVATION AND KNOWLEDGE OF THE SITE HISTORY.	< 50 *

LEGEND

- ▲ AHBP ALLOWABLE HORIZONTAL BEARING PRESSURE FOR:
 - 10 mm MOVEMENT.
 - CENTRE OF THRUST 800 mm BELOW THE NATURAL SURFACE LEVEL.
 - HIGH WATER TABLE.
- * SPECIAL GEOTECHNICAL ASSESSMENT REQUIRED

DESIGNED:	K. DAWSON		DATE:	11/03/2011	
DRAWN:	D. TOLENTINO		DATE:	11/03/2011	
CHECKED:	NAME	DATE	APPROVED:	NAME	DATE
	<input checked="" type="checkbox"/> CWW	R. JAGGER 23/03/12	<input checked="" type="checkbox"/> CWW	R.CARRUTHERS 23/03/12	
	<input checked="" type="checkbox"/> SEWL	C.PAXMAN 23/03/12	<input checked="" type="checkbox"/> SEWL	G.REYNOLDS 23/03/12	
	<input checked="" type="checkbox"/> YVW	S. TAN 23/03/12	<input checked="" type="checkbox"/> YVW	A.COSHAM 23/03/12	
2	PUBLISHED FIRST ISSUE	23/03/12	K. DAWSON		
1	PRE PUBLISHED DRAFT FOR COMMENT	12/07/11	K. DAWSON		
REV	DESCRIPTION	DATE	APPROVED		

MELBOURNE RETAIL WATER AGENCIES





WITH ACKNOWLEDGEMENT TO WATER SERVICES ASSOCIATION of Australia

MRWA WATER SUPPLY STANDARD DRAWINGS

SOIL CLASSIFICATION GUIDELINES AND ALLOWABLE HORIZONTAL BEARING PRESSURE

NOT TO SCALE

MRWA-W-200

ISSUED 2012 | VERSION 2