LADDERS AND STAIRWAYS - GENERAL REQUIREMENTS

THIS STANDARD IS INTENDED TO BE READ IN CONJUNCTION WITH MRWA-S-314. IT HAS BEEN PREPARED TO EXTEND AS 1657 TO SUIT ASSETS COMMONLY FOUND IN THE WATER INDUSTRY, AND TO INCLUDE OTHER SEW REQUIREMENTS SUCH AS SECURITY PROVISIONS.

TABLE 1: KEY PRINCIPLES AFFECTING LADDER AND STAIRWAY DESIGN DECISIONS

LADDER AND STAIRWAY ARRANGEMENTS SHALL BE SAFE, EFFICIENT AND RELIABLE FOR ENTRY, EGRESS AND RESCUE OF WORKERS. SEE BELOW PRINCIPLES AND REQUIREMENTS, IN NO PARTICULAR ORDER.

ITEM	PRINCIPLE	REQUIREMENT
A	NOT BE IMPEDED BY OTHER ITEMS	HAVE CLEAR SPACE FOR A USER AROUND TOP & BOTTOM WITHOUT IMPEDIMENTS ALONG LENGTH
B	NOT IMPEDE THE ACCESS OR RESCUE OF WORKERS	STAIRWAY AND LADDER STRUCTURES SHALL NOT INTERFERE WITH HEIGHT SAFETY OR RESCUE EQUIPMENT, SUCH AS SAFETY LIFELINES
C	BE DURABLE IN THE ENVIRONMENT TO WHICH THEY WILL BE EXPOSED (ie: WILL NOT CORRODE)	SELECT MATERIALS IN ACCORDANCE WITH TABLE 3
D	BE STRUCTURALLY SOUND AND RIGID	COMPLY WITH MATERIAL AND DIMENSIONAL REQUIREMENTS IN THIS STANDARD AS A MINIMUM. SECURELY FASTEN TO THE STRUCTURE. BESPOKE DESIGNS SHALL BE COMPLETED BY A SUITABLY QUALIFIED STRUCTURAL ENGINEER
E	PROVIDE 3 POINTS OF CONTACT	STAIRWAYS REQUIRE HANDRAILS AND LADDERS REQUIRE STYLES ELEVATED TO ABOVE GROUND LEVEL
F	BE SLIP RESISTANT	LADDER RUNGS, LANDING SURFACES AND STEP TREADS SHALL BE NON-SLIP TO SUIT THE AREA, eg: DUSTY, SLIMY, WET. STEPS SHALL HAVE STAIR TREAD COVERS (STAIR NOSING). LADDER RUNGS SHALL BE ONE OF: 1) RE-BAR, or 2) STRAIGHT BAR WITH GROOVES OR GRIT IMPREGNATED, or 3) INCLUDE SLIP RESISTANT RUNG COVERS. STEP TREAD SURFACES SHALL ALWAYS HAVE A SUITABLE NON-SKID FINISH APPLIED. SELECT ANY COATINGS IN ACCORDANCE WITH WSA201 MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS.
G	HAVE PREDICTABLE FOOTHOLD SPACING	RUNGS AND STEPS SHALL HAVE AN EQUAL TREAD - RISE IN ACCORDANCE WITH AS 1657
H	BE CLEAR OF PIT COVERS WHEN COVERS ARE OPEN OR CLOSED	PIT ACCESS ARRANGEMENT SHALL BE BELOW THE UNDERSIDE OF ANY COVERS (AND CROSS BEAMS / RIBS) WHEN THE COVERS ARE CLOSED. PIT COVERS SHALL NOT IMPEDE ACCESS WHEN OPEN.

TABLE 2: SHEET INDEX FOR THIS STANDARD

FABRICATION REQUIREMENTS:

A. ALL DIMENSIONS ARE IN mm UNLESS STATED OTHERWISE.
B. LADDERS AND STAIRWAYS SHALL CONFORM TO AS 1657.
   TEST STAIRWAYS, LADDERS AND LANDINGS IN ACCORDANCE WITH AS 1657.
C. FABRICATION DRAWINGS SHALL BE SUBMITTED TO SEW FOR REVIEW.
D. THICKNESSES STATED ARE MINIMUM THICKNESS.
E. FIXTURES AND LADDERS SHALL BE MOUNTED TO ENABLE EASY REMOVAL / REPLACEMENT.
F. ALL SAME METAL JOINTS SHALL BE WELDED WHERE PRACTICABLE.
   VISUAL INSPECT ALL WELDS.
   NON DESTRUCTIVE TESTING TO AS 1554 REQUIREMENTS- MINIMUM 5% OF WELDS OF ANY FABRICATION.
G. MINIMISE JOINTS BY FOLDING OR BENDING WHERE PRACTICABLE.
H. ALL DISSIMILAR METAL JOINTS SHALL BE INSULATED TO PREVENT DISSIMILAR METAL CORROSION.
I. GRATING IS PREFERRED FOR PLATFORMS WHERE PRACTICABLE.

TABLE 3: ACCEPTABLE MATERIAL OPTIONS

ENVIRONMENT	LADDERS / LANDINGS	STAIRWAYS	SHIELD / CAGE	DOOR / HATCH
WATER (RAIN, DRINKING OR NON DRINKING WATER) [5]	SS316/316L DUAL CERTIFIED or FRP [2, 4]	SS316/316L DUAL CERTIFIED, CONCRETE or FRP [2, 4]	SS316/316L DUAL CERTIFIED, ALUMINIUM or FRP [2, 4]	ALUMINIUM CHECKER PLATE
SEWAGE (LOW H_2S) [1]	SS316/316L DUAL CERTIFIED or FRP [2, 4]	SS316/316L DUAL CERTIFIED, CONCRETE or FRP [2, 4]	SS316/316L DUAL CERTIFIED, ALUMINIUM or FRP [2, 4]	ALUMINIUM CHECKER PLATE
SEWAGE (MODERATE H_2S) [1]	SS316/316L DUAL CERTIFIED or FRP [4]	SS316/316L DUAL CERTIFIED, COATED[3] CONCRETE or FRP	SS316/316L DUAL CERTIFIED or FRP [4]	SS316/316L DUAL CERTIFIED or FRP [4]
SEWAGE (HIGH H_2S) [1]	LOCATION DEPENDENT, REFER SEW			
TREATMENT PLANTS	THE MATERIAL SHALL BE SELECTED ON A CASE BY CASE BASIS ACCORDING TO THE SUBSTANCES TO WHICH THE LADDER MAY COME INTO CONTACT. WHERE THE ENVIRONMENT IS WATER OR SEWAGE, THE MATERIALS LISTED ABOVE MAY BE USED.			

TABLE 3 NOTES:

SS = STAINLESS STEELTO AS 1449. FINISH CLASS 2B.
FRP = FIBRE REINFORCED PLASTIC. VINYL ESTER RESIN.
MATERIAL SELECTION SHALL CONFORM TO AM2739 CORROSION MITIGATION STANDARD AND AM2760 STAINLESS STEEL STANDARD.

[1] LOW, MEDIUM AND HIGH H_2S (RISK) LEVELS ARE DEFINED WITHIN MRWA-S-400.
[2] GALVANISED STEEL MAY BE CONSIDERED ON A CASE BY CASE BASIS AND REQUIRES SEW APPROVAL (eg: MAY BE ALLOWED FOR TEMPORARY ASSETS).
[3] COATINGS AND LININGS IN ACCORDANCE WITH MRWA GRAVITY SEWERAGE STANDARD TABLE 307-E.
[4] FRP SHOULD NOT BE USED FOR ITEMS EXPOSED TO UV LIGHT FOR ANY SIGNIFICANT PERIOD.
[5] ONLY ONE BARE (UNCOATED) METAL MAY BE IMMERSED IN THE SAME WATER BODY (ie: ONLY ONE METAL ALLOWED BELOW THE TOP WATER LEVEL WITHIN A RESERVOIR OR TANK).

TABLE 4: MOST RELEVANT APPLICABLE STANDARDS

1	AS 1657 - FIXED PLATFORMS, WALKWAYS, STAIRWAYS AND LADDERS
2	BS 1603- FALL PREVENTION PROCEDURE
3	AM2759 - FACILITY RESILIENCE AND SECURITY TECHNICAL STANDARD
4	WSA201 - MANUAL FOR THE SELECTION AND APPLICATION OF PROTECTIVE COATINGS
5	AM2760 - STAINLESS STEEL SPECIFICATION
6	AM2739 - CORROSION MITIGATION STANDARD
7	AM2884 - PIT STANDARD
8	AM2757 - COVERS FOR UNDERGROUND STRUCTURES
9	AS / NZS 1665 - WELDING OF ALUMINIUM STRUCTURES
10	AS 4100 - STEEL STRUCTURES
11	AS / NZS 1554 - STRUCTURAL STEEL WELDING

PIT AND BUND ACCESS SELECTION

TABLE 5: PIT AND BUND ACCESS SELECTION (IN PREFERENCE ORDER)

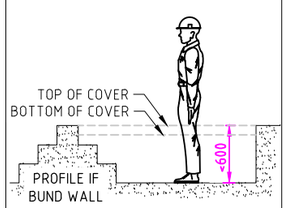
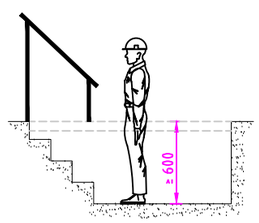
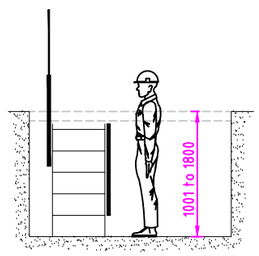
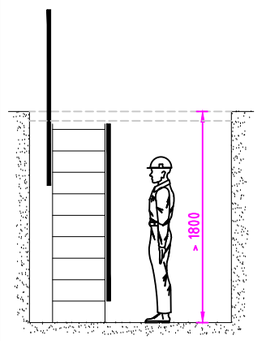
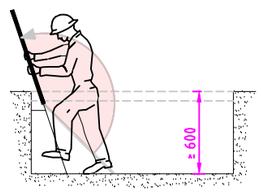
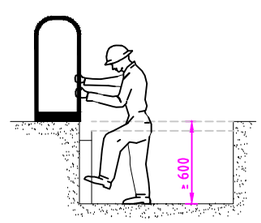
OPTION	1st		2nd			3rd
PIT DEPTH	< 600	≥600	1000 to 1800	> 1800	≥600	≥600
DESCRIPTION	NO STEP OR STEPS WITHOUT HANDRAILS	STAIRWAY TO PIT FLOOR	TELESCOPIC 2-PART RETRACTABLE STANCHION	SINGLE PART RETRACTABLE STANCHION	ROTATING STANCHIONS	PERMANENT ABOVE GROUND HANDRAIL
SITUATIONS OF USE	ALL PITS AND BUNDS OF THIS DEPTH	SUFFICIENT SPACE IN OR ADJACENT TO PIT FOR STAIRWAY	1st PREFERENCE NOT PRACTICABLE			1st AND 2nd PREFERENCES NOT PRACTICABLE
REFERENCE	AM2884 PIT STANDARD	SHEET 4	APPROVED PRODUCT DATA SHEET [1]	SHEET 3	SHEET 5	SHEET 6
SCHEMATIC	 NO STEPS ACCEPTABLE FOR LOW FREQUENCY, VERY SHALLOW OR RESTRICTED SPACES, OTHERWISE STEPS SHALL BE PROVIDED.					

TABLE 5 NOTES:

LOWER PREFERENCE OPTIONS MAY ONLY BE CONSIDERED WHEN HIGHER PREFERENCE OPTIONS ARE PROVEN TO BE IMPRACTICABLE.

[1] TWO PART RETRACTABLE STANCHIONS SHALL BE DESIGNED, SELECTED, FABRICATED AND INSTALLED IN ACCORDANCE WITH THE SEW PRODUCTS LISTING IN THE MRWA PRODUCTS WEB PORTAL OR APPROVED EQUIVALENT. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

[2] TURRET TOP COVERED PITS TO USE ONLY THE RETRACTABLE STANCHION OPTIONS, ALBEIT WHAT IS SHOWN AS GROUND LEVEL WOULD BE TOP OF TURRET LEVEL.

[3] ALL FIGURES ARE SHOWN WITHOUT COVERS IN PLACE.

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APP'D	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

DESIGNER	DRAFTER	SEW PROJECT MANAGER
R. JAGGER	R. JAGGER	J. MCKIMMIE
DESIGN REVIEW	DRAFT CHECK	ASSET/ENG. MANAGER
M. LOWE	S. PHILLIPS	R. FERNANDO
APPROVED		
J. MCKIMMIE		

South East Water
101 Wells Street, Frankston, VIC 3199 W : www.sew.com.au
T : 61 3 9552 3000 F : 61 3 9552 3001 E : info@sew.com.au

SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD
GENERAL REQUIREMENTS, AND
PIT AND BUND ACCESS

DATUM: NA	
MELWAY REF: NA	
SCALE: AS SHOWN	SHEET SIZE: A1
SEW DRAWING NUMBER	
AM2922- SHEET 1	B
SEW JOB No:	REV

TABLE 6: ELEVATED STRUCTURE ACCESS SELECTION (IN PREFERENCE ORDER)

OPTION	1st	2nd	3rd
DESCRIPTION	STAIRWAY (WITH LANDINGS WHEN REQUIRED)	INCLINED RUNG LADDER (WITH LANDINGS WHEN REQUIRED)	VERTICAL RUNG LADDER (WITH LANDINGS AS REQUIRED)
SITUATIONS OF USE	MORE FREQUENTLY ACCESSED ELEVATED STRUCTURE WITH SUFFICIENT SPACE FOR A STAIRWAY. (ie: THERE ARE MULTIPLE ITEMS WHICH REQUIRE AT LEAST 12 MONTHLY MAINTENANCE)	LESS FREQUENTLY ACCESSED ELEVATED STRUCTURE. (ie: THERE ARE FEW IF ANY ITEMS WHICH REQUIRE AT LEAST 12 MONTHLY MAINTENANCE)	LESS FREQUENTLY ACCESSED ELEVATED STRUCTURE AND INSUFFICIENT SPACE FOR THE 2nd OPTION
ADDITIONAL REQUIREMENTS	CLIMB PREVENTION IF STRUCTURE > 3m TALL AND STAIRWAY IS EXTERNAL TO THE STRUCTURE	CLIMB PREVENTION IF EXTERNAL. JIB OR CRANE MOUNTED AT STRUCTURE TOP. CRANE RATING TO BE BASED ON THE HEAVIEST ELEVATED EQUIPMENT WHICH MAY NEED TO BE REPLACED	
ELEVATION SCHEMATIC	REFER TABLE 7 FIGURE A	REFER TABLE 7 FIGURE B	REFER TABLE 7 FIGURE C

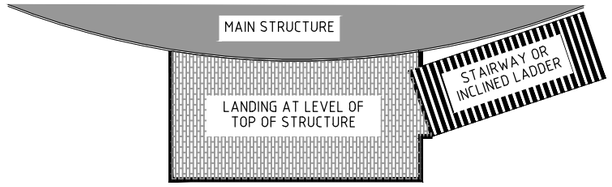


FIGURE 1: PLAN VIEW. PREFERRED ACCESS STRUCTURE ALIGNMENT WITH ELEVATED STRUCTURE

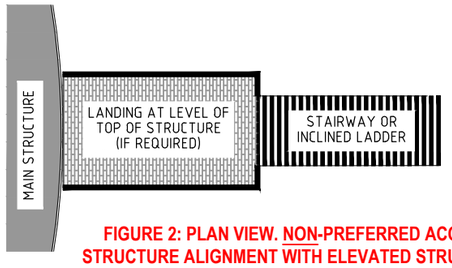
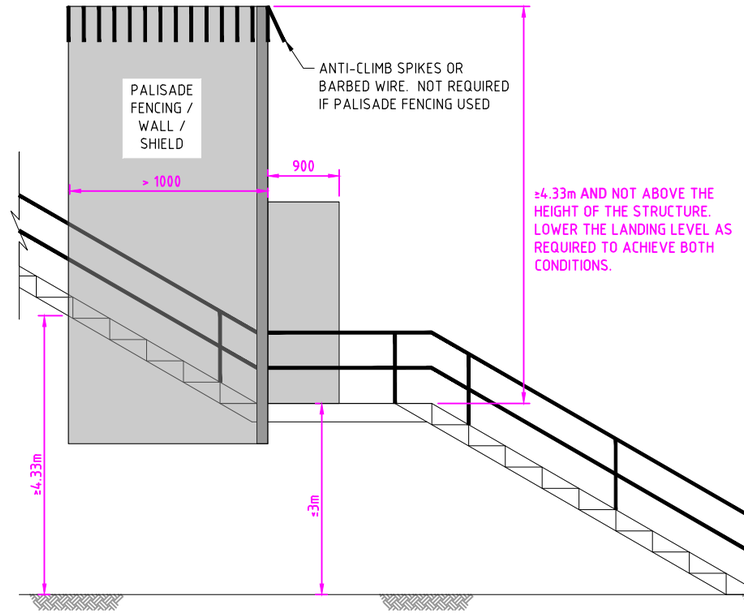
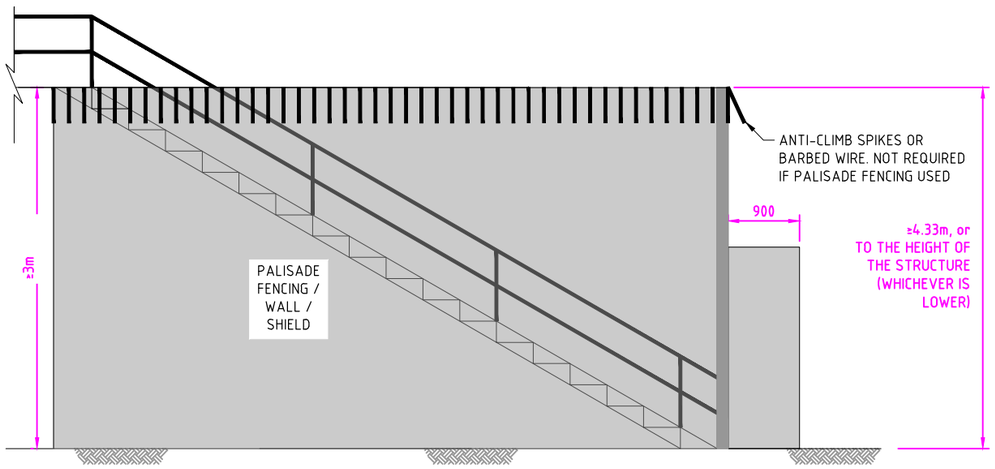


FIGURE 2: PLAN VIEW. NON-PREFERRED ACCESS STRUCTURE ALIGNMENT WITH ELEVATED STRUCTURE

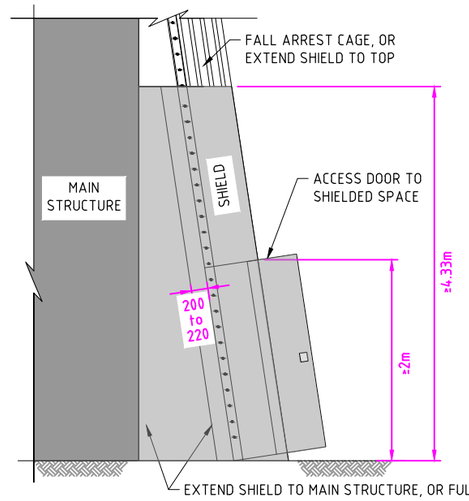
TABLE 7: CLIMB PREVENTION SELECTION IN PREFERENCE ORDER. LOWER PREFERENCE OPTIONS MAY ONLY BE CONSIDERED WHEN HIGHER PREFERENCE OPTIONS ARE PROVEN TO BE IMPRACTICABLE.

OPTION	1st	2nd	3rd
DESCRIPTION	EXTERNAL STAIRWAY WITH ELEVATED WALL OR SHIELD	GROUND LEVEL WALL, SHIELD OR FENCE AND DOOR AROUND AN EXTERNAL LADDER	LOCKED HATCH AT BOTTOM OF EXTERNAL LADDER SHIELD
SITUATIONS OF USE	STRUCTURES >3m ABOVE GROUND)	STRUCTURES >3m ABOVE GROUND) AND STAIRWAY IMPRACTICABLE	STRUCTURES >3m ABOVE GROUND) AND 1st or 2nd PREFERENCE IMPRACTICABLE
FIGURE ID	FIGURE A	FIGURE B	FIGURE C
ELEVATION SCHEMATIC		THIS CLIMB PREVENTION SYSTEM CAN BE APPLIED TO VERTICAL LADDERS	THIS CLIMB PREVENTION SYSTEM CAN BE APPLIED TO INCLINED LADDERS



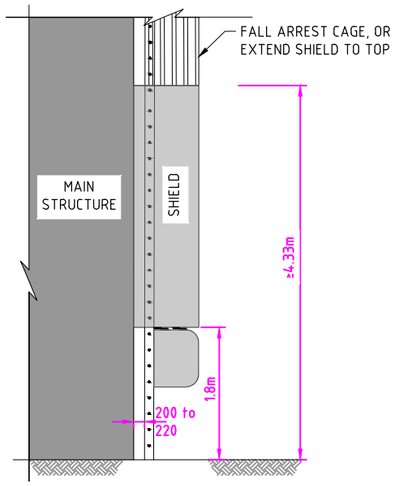


NO CLIMB PREVENTION REQUIRED FOR STRUCTURES < 3m HEIGHT



EXTEND SHIELD TO MAIN STRUCTURE, OR FULLY WRAP SHIELD BEHIND LADDER TO PREVENT CLIMBING UP THE BACK OF THE LADDER

INCLINED LADDERS SHALL NOT EXCEED 6m IN HEIGHT



REFER SHEET 6 FIGURE 6 FOR DETAILS ON THE LOCKED HATCH DESIGN

WHERE THE VERTICAL FALL DISTANCE FROM A LADDER EXCEEDS 6m, A COMPLIANT FALL-ARREST SYSTEM SHALL BE INSTALLED

ELEVATED STRUCTURE ACCESS PREVENTION SYSTEM NOTES:

A. THESE ACCESS STANDARDS APPLY TO ASCENDING AN ELEVATED STRUCTURE OR DESCENDING INTO A BASEMENT OR BELOW GROUND AREA WHICH IS NOT CONFINED. DESCENDING INTO A CONFINED SPACE SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE PIT ACCESS STANDARDS (REFER SHEET 1), WHERE PROVISION IS MADE FOR WORKERS TO BE ON A LIFELINE.
B. WHERE PRACTICABLE, ACCESS STRUCTURES SHALL BE ALIGNED AGAINST THE MAIN STRUCTURE RATHER THAN OUTWARDLY PROJECTED FROM THE MAIN STRUCTURE. REFER FIGURE 1 AND 2.
C. WHERE STRAIGHT ACCESS STRUCTURES ARE ALIGNED AGAINST ROUND MAIN STRUCTURES, ENSURE:
   C.A. GAPS BETWEEN THE ACCESS AND MAIN STRUCTURE ARE < 200 WIDE.
   C.B. KICKPLATES ARE PROVIDED ALONG THE INNER EDGE OF THE PLATFORM OR STAIRWAY.

CLIMB PREVENTION DESIGN AND FABRICATION:

D. DOORS SHALL BE FITTED WITH 3 NO. SS316 HINGES CONSISTING OF ≥5mm THICK PLATE AND ≥5mm DIAMETER PINS.
E. DOORS SHALL BE FITTED WITH DOOR RESTRAINTS (TO KEEP OPEN).
F. DOOR AND HATCH PADBOLT LOCKS SHALL BE HEAVY DUTY, FIT STANDARD SEW PADLOCKS AND BE PROVIDED WITH PLATE SECURITY SHIELD.
G. LADDER SHIELDS TO SATISFY THE GEOMETRIC REQUIREMENTS OF CAGES.
H. SHIELDING MATERIAL SHALL BE ≥2mm THICK IF GALVANISED OR STAINLESS STEEL OR ≥3mm THICK IF ALUMINIUM. STRUCTURALLY STIFFEN AS REQUIRED TO ACHIEVE LESS THAN 10mm DEFLECTION ON APPLICATION OF 100kN LOAD NORMAL TO THE SURFACE.
I. PALISADE FENCING MAY BE USED INSTEAD OF SHIELDING, ALTHOUGH MULTIPLE PALES WILL NEED TO BE SET ONE ON TOP OF THE OTHER TO ACHIEVE THE REQUIRED HEIGHT.

CLIMB PREVENTION GENERAL NOTES:

1. IT IS ASSUMED THAT THE PRIMARY MEASURE FOR THE PREVENTION OF UNAUTHORISED CLIMBING OF ELEVATED STRUCTURES IS A SECURITY FENCE AND OTHER SECURITY ASSETS (ie: CCTV). REFER AM2759 – SEW FACILITY RESILIENCE AND SECURITY TECHNICAL STANDARD.
2. SECONDARY CLIMB PREVENTION MEASURES ARE REQUIRED FOR STRUCTURES GREATER THAN 3m TALL AND MAY BE REQUIRED FOR STRUCTURES > 2m TALL. FALLS FROM HEIGHTS LOWER THAN THIS ARE LESS LIKELY TO BE HAVE SERIOUS CONSEQUENCES.
3. PREVENTATIVE MEASURES SHALL BE DESIGNED TO DETER PEOPLE WITH HIGH (BUT NOT EXCEPTIONAL) PHYSICAL CAPABILITY USING OPPORTUNISTIC CLIMBING AIDS SUCH AS A CRATE OR WHEELY BIN. TYPICALLY, THIS WOULD MEAN BASING THE PREVENTATIVE MEASURES ON DETERRING PEOPLE CAPABLE OF JUMPING TO A HAND HOLD AND THEN RAISING THEMSELVES TO A STANDING POSITION ON THAT HAND HOLD.
4. ON THIS BASIS, POTENTIAL HANDHOLDS (ie: TOP OF WALL, STRUCTURE MOUNTING BRACKET etc) SHALL BE GREATER THAN 4.33m HIGH. THIS HAS BEEN CALCULATED BASED ON: a) HEIGHT OF A WHEELIE BIN (1000mm HIGH) + b) AVERAGE VERTICAL JUMP FOR 21 YR OLD MALE (600mm) + c) AUSTRALIAN MALE ONE STANDARD DEVIATION (85 PERCENTILE) FROM AVERAGE HEIGHT (1830mm) + d) HALF ARM SPAN BASED ON HEIGHT (900mm).
   IT IS NOT CONSIDERED PRACTICABLE TO BASE PREVENTATIVE MEASURES ON THE USE OF CLIMBING AIDS SUCH AS PORTABLE LADDERS AND GRAPPLING HOOKS.

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APP'D	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

DESIGNER R. JAGGER	DRAFTER R. JAGGER	SEW PROJECT MANAGER J. MCKIMMIE
DESIGN REVIEW M. LOWE	DRAFT CHECK S. PHILLIPS	ASSET/ENG. MANAGER R. FERNANDO
APPROVED J. MCKIMMIE		

South East Water
101 Wells Street, Frankston, VIC 3199 W : www.sew.com.au
T : 61 3 9552 3000 F : 61 3 9552 3001 E : info@sew.com.au

SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD ELEVATED STRUCTURES ACCESS, AND CLIMB PREVENTION

DATUM: NA
MELWAY REF: NA
SCALE: AS SHOWN
SHEET SIZE: A1
SEW DRAWING NUMBER
AM2922- SHEET 2
REV: B
SEW JOB No:

CAD FILE NAME: C:\Users\jmckimmi\Downloads\ SEW Fixed Ladder and Stairway Standard 111.dwg
Plotted @ 13/1/2026 12:06pm by jmckimmi

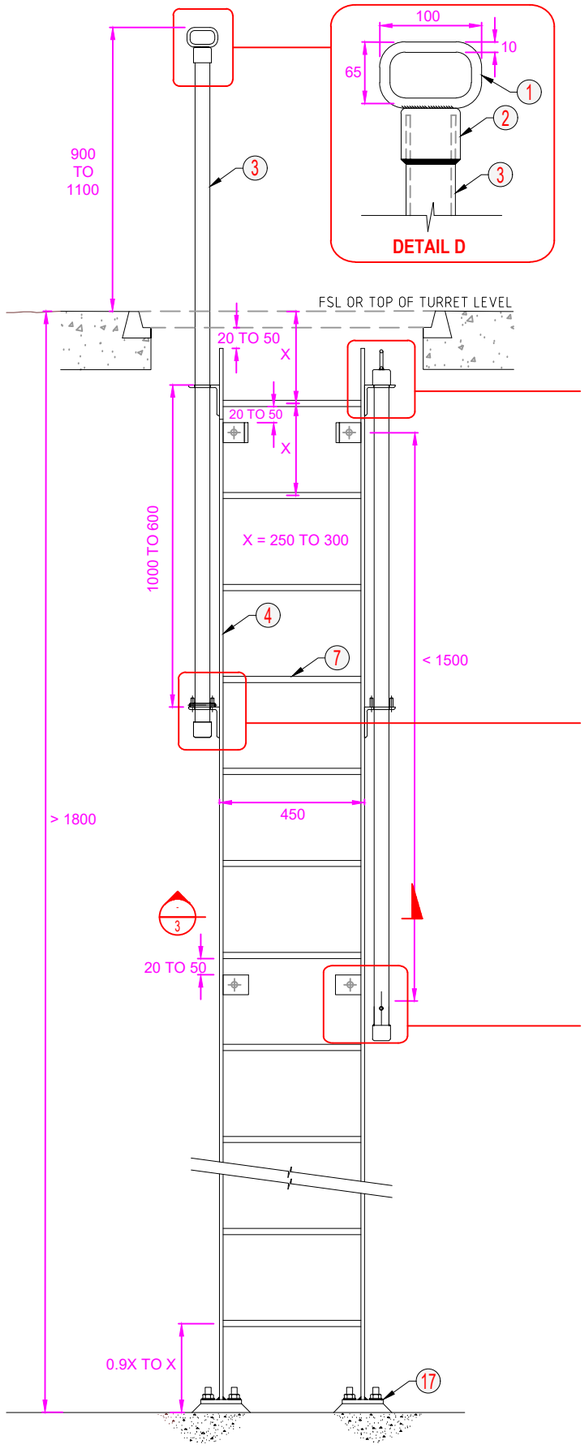
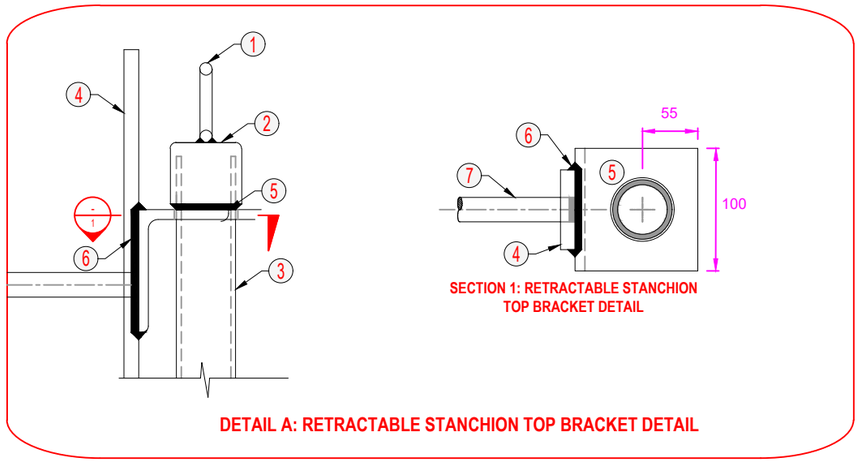
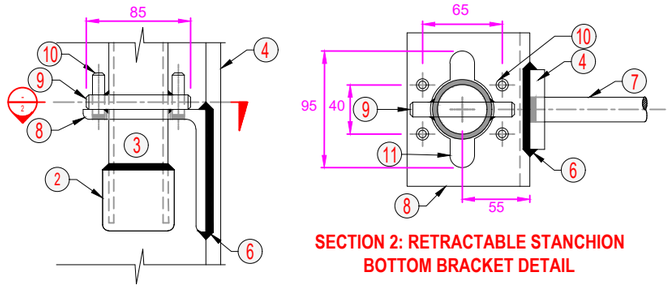


FIGURE 3: ELEVATION, LADDER WITH ONE-PIECE RETRACTABLE STANCHIONS



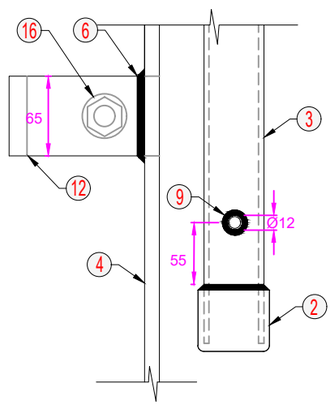
SECTION 1: RETRACTABLE STANCHION TOP BRACKET DETAIL

DETAIL A: RETRACTABLE STANCHION TOP BRACKET DETAIL

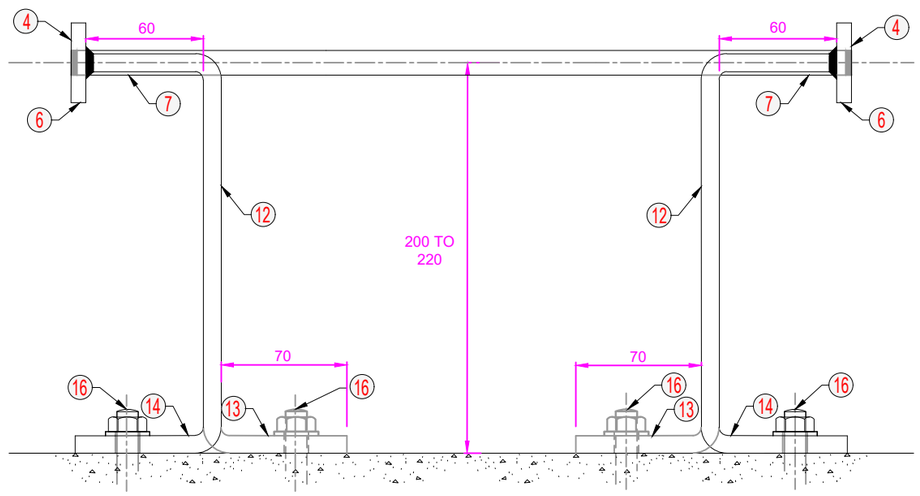


SECTION 2: RETRACTABLE STANCHION BOTTOM BRACKET DETAIL

DETAIL B: RETRACTABLE STANCHION BOTTOM BRACKET DETAIL



DETAIL C: LADDER WALL MOUNTING DETAIL



SECTION 3: LADDER WALL MOUNTING DETAIL

TABLE 8: FIGURE 1 ITEMS SCHEDULE

	ITEM	ITEM DESCRIPTION / DETAILS
1	PULL RING	100W X 65H X Ø10 ROD, WELDED TO ITEM 2
2	STANCHION SCREW CAP	≥3 WALL THICKNESS CAP, WELDED WITH 3mm FILLET WELD TO ITEM 3 AT TOP AND BOTTOM
3	RETRACTABLE STANCHION TUBE	Ø50 X 3 THICK TUBE
4	FIXED STILES	12 X 50 BAR
5	RETRACTABLE STANCHION TOP BRACKET	100 LONG 100 X 100 X 8 ANGLE, WITH 52 HOLE FOR SLIDING RETRACTABLE STANCHION
6	≥6mm FILLET WELD	ALL WELDS SHALL BE TO AS 1554.5. INSPECT AS PER GENERAL NOTES
7	LADDER RUNG	Ø20 RE-BAR OR GROOVED OR GRIT IMPREGNATED Ø20 BAR. PLUG WELD AND GRIND EXCESS FLUSH AT STYLES. EQUI-SPACE RUNGS 250 TO 300 APART.
8	RETRACTABLE STANCHION BOTTOM BRACKET	125 LONG 100 X 100 X 8 ANGLE, WITH 52 HOLE FOR SLIDING RETRACTABLE STANCHION
9	RETRACTABLE STANCHION LOCATING PIN	Ø12 X 85 ROD, INSET INTO AND WELDED TO ITEM 3
10	RETRACTABLE STANCHION BOTTOM BRACKET STOP PINS (4 NO.)	Ø10 X 30 ROD, PLUG WELD TO ITEM 8
11	RETRACTABLE STANCHION BOTTOM BRACKET SLOT FOR LOCATING PIN TRAVEL	20 X 95
12	WALL BRACKET WITH CRANK	65 X 12 BAR, LENGTH TO SUIT
13	BRACKET FASTENERS	M16 X 45, WITH NYLOC NUTS
14	WALL BRACKET CRANK, FACING OUTWARDS	FACE CRANK OUTWARDS WHERE PRACTICABLE
15	WALL BRACKET CRANK, FACING INWARDS	MAYBE NECESSARY WHERE RETRACTABLE STANCHIONS WOULD OTHERWISE INTERFERE WITH PLACEMENT OF OUTWARDS FACING CRANK
16	WALL BRACKET FASTENER	REFER MRWA SEWERAGE STANDARD FIGURES 314-F, G AND H
17	FLOOR MOUNTING BRACKET AND FASTENERS	140 X 65 X 10 PLATE AND 2 NO. FASTENERS IN ACCORDANCE WITH MRWA SEWERAGE STANDARD FIGURE 314-F OR G

NOTES:

1. THIS STANDARD DRAWING SUPERSEDES SEWL.STD.005
2. SEQUENCE OF OPERATION OF A RETRACTABLE STANCHION FROM THE LOWERED POSITION IS AS FOLLOWS:
   - 2.1. FROM KNEELING POSITION AT GROUND LEVEL, REACH IN TO GRAB THE PULL RING (ITEM 1), THEN
   - 2.2. PULL THE STANCHION UPWARDS, MAKING SURE THE LOCATING PIN (ITEM 9) PASSES THROUGH THE SLOT IN THE BOTTOM BRACKET (ITEM 11) AND IS ABOVE THE TOP OF THE STOP PIN (ITEM 10), THEN
   - 2.3. ROTATE THE PULL RING 90° SO THAT THE LOCKING PIN ALIGNS 90° TO THE SLOT, THEN
   - 2.4. LOWER THE STANCHION DOWN SO THAT THE LOCKING PIN RESTS ON THE BOTTOM BRACKET BETWEEN TWO STOP PINS.

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APP'D	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

DESIGNER: M. LOWE | DRAFTER: R. JAGGER | SEW PROJECT MANAGER: J. MCKIMMIE
DESIGN REVIEW: M. LOWE | DRAFT CHECK: S. PHILLIPS | ASSET/ENG. MANAGER: R. FERNANDO
APPROVED: J. MCKIMMIE

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101 Wells Street, Frankston, VIC 3199 W : www.sew.com.au
T : 61 3 9552 3000 F : 61 3 9552 3001 E : info@sew.com.au

SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD
LADDER WITH ONE PIECE
RETRACTABLE STANCHIONS

DATUM: NA | MELWAY REF: NA | SCALE: AS SHOWN | SHEET SIZE: A1
SEW DRAWING NUMBER
AM2922- SHEET 3 | B
SEW JOB No: | REV

CAD FILE NAME: (\Users\jmckimmi\Downloads\ SEW Fixed Ladder and Stairway Standard (1).dwg
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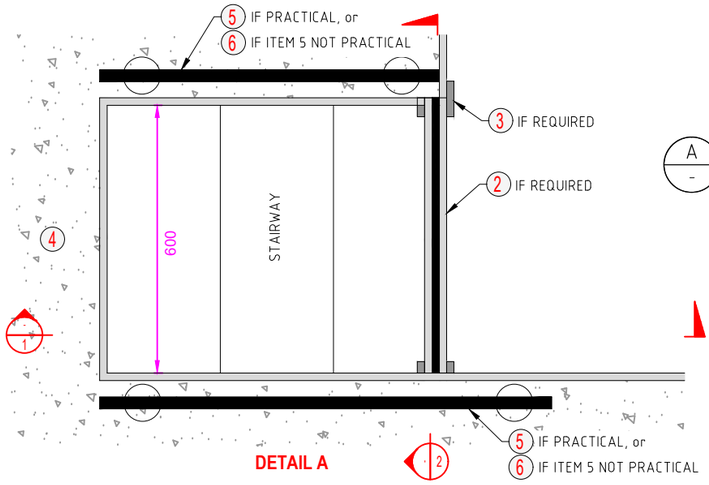
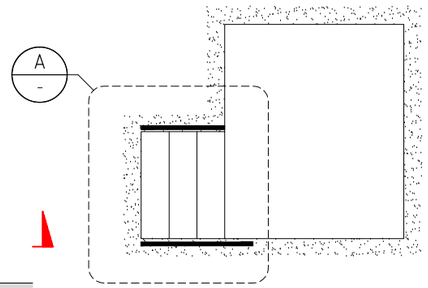


DETAIL A



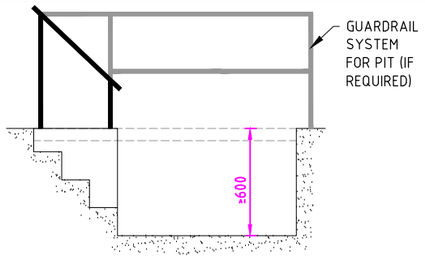
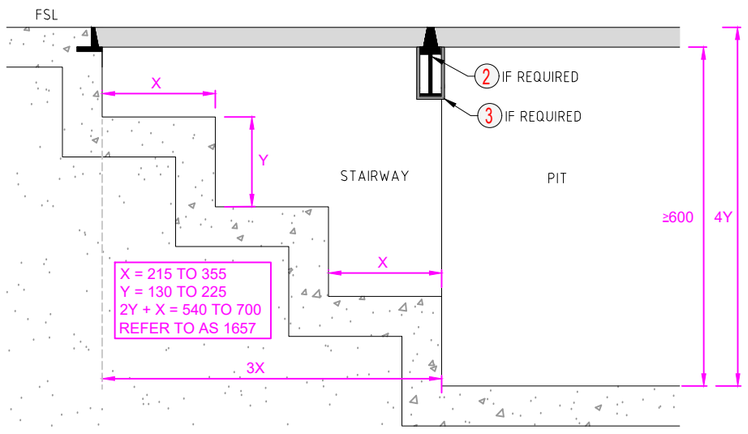


FIGURE 4: STAIRWAY ADJACENT TO PIT ARRANGEMENT

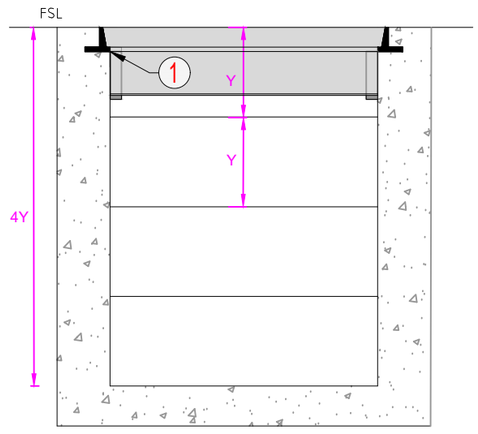
ENSURE FALL PROTECTION FOR ENTIRE PIT IS PROVIDED AS PER AM2884 PIT STANDARD

TABLE 9: ITEMS SCHEDULE

	ITEM	DETAILS
1	FRAME FOR COVERS	REFER AM2757 COVERS STANDARD
2	COVER SUPPORT BEAM	ONLY REQUIRED IF DUCTILE IRON COVERS. ALTERNATIVE COVERS (ie: METAL COVERS) PREFERRED WHERE PRACTICABLE. PLACE IN WALL BRACKETS. REMOVE PRIOR TO ENTRY INTO PIT
3	SUPPORT BEAM WALL BRACKET	REFER MANUFACTURER'S PRODUCT INFORMATION
4	HARDSTAND AREA	EXTEND >100 BEYOND EXTENT OF STAIRWAY AND AS REQUIRED IN AM2757
5	FIXED HANDRAIL	PLACE FIXED HANDRAIL ADJACENT TO STAIRWAY AT SAME INCLINE AS STAIRWAY WHERE PRACTICAL
6	COLLAPSIBLE HANDRAIL	PLACE COLLAPSIBLE HANDRAIL ADJACENT TO STAIRWAY AT SAME INCLINE AS STAIRWAY WHERE FIXED HANDRAIL NOT PRACTICAL (ie: WHERE PIT IS TRAFFICABLE OR THERE IS NO WALL (GROUND) ADJACENT TO THE STAIRWAY. CONCEPT IS AS PER HOLMWOOD HIGHGATE TANKER TRUCKS. PROVIDE A CHAIN ATTACHED TO JUST BELOW THE COVER FRAME NEAR THE STAIRWAY FOR ERECTING / LOWERING THE HANDRAIL. ENSURE HANDRAIL LOCKS IN PLACE WHEN ERECTED.
7	EYEBOLT & CHAIN	SS316. Φ20 EYEBOLT AND 3mm WELDED LINK CHAIN



SECTION 1 SHOWN WITH COVERS IN PLACE AND NO HANDRAILS



SECTION 2

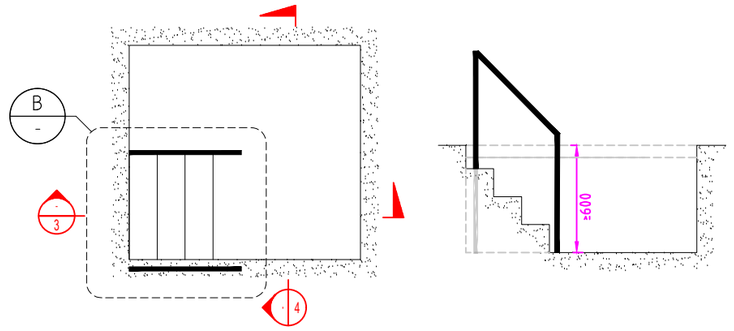
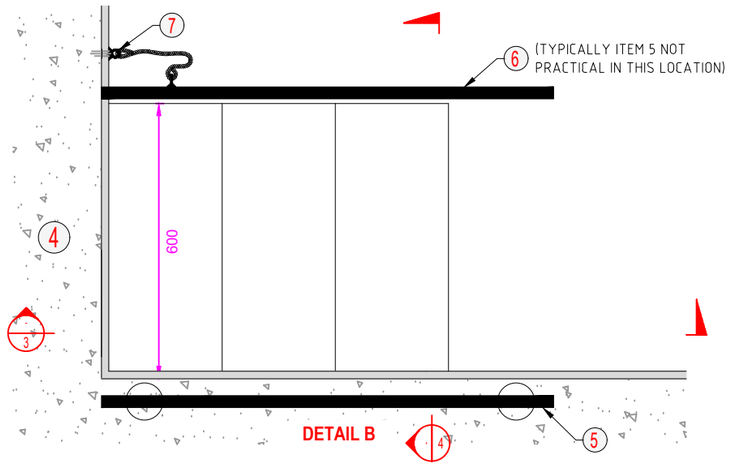


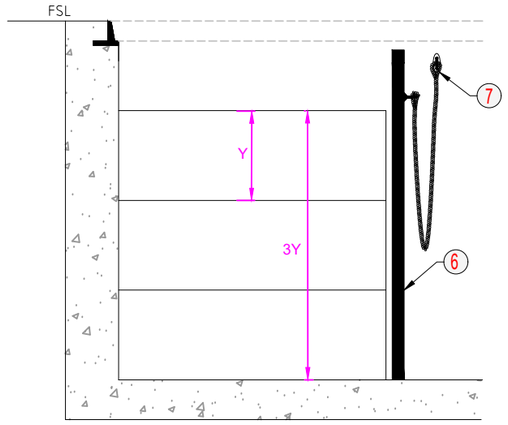
FIGURE 5: STAIRWAY WITHIN PIT ARRANGEMENT

BOTH SIDES OF STAIRWAYS REQUIRE HANDRAILS, FIXED HANDRAILS IF POSSIBLE, OR COLLAPSIBLE HANDRAILS IF FIXED HANDRAILS ARE NOT PRACTICAL.
CONCRETE STAIRS INDICATED IN DETAIL B. STAIRWAY COULD BE A METALLIC STAIRWAY.

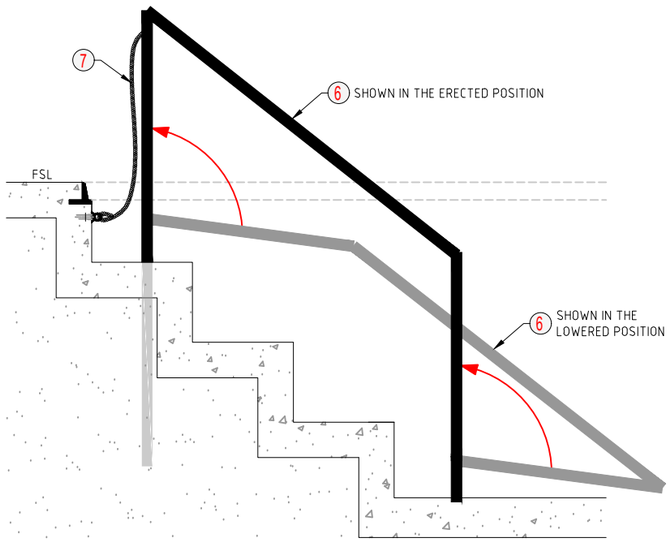


DETAIL B

HANDRAIL NOT SHOWN ON THIS SIDE FOR CLARITY



SECTION 4



SECTION 3 SHOWN WITH COVERS REMOVED

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APP'D	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

DESIGNER R. JAGGER	DRAFTER R. JAGGER	SEW PROJECT MANAGER J. MCKIMMIE
DESIGN REVIEW M. LOWE	DRAFT CHECK S. PHILLIPS	ASSET/ENG. MANAGER R. FERNANDO
APPROVED J. MCKIMMIE		

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T : 61 3 9552 3000 F : 61 3 9552 3001 E : info@sew.com.au

SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD

PIT STAIRWAY DETAILS

DATUM: NA	
MELWAY REF: NA	
SCALE: AS SHOWN	SHEET SIZE: A1
SEW DRAWING NUMBER	
AM2922- SHEET 4	B
SEW JOB No:	REV

CAD FILE NAME: (\Users\jmckimmi\Downloads\ SEW Fixed Ladder and Stairway Standard (1).dwg
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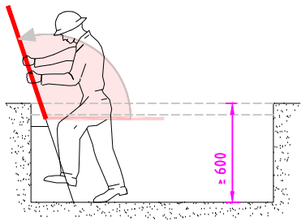


FIGURE 6: ROTATING STANCHION ARRANGEMENT

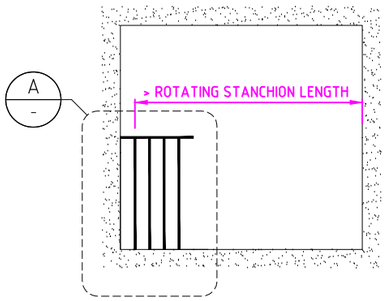
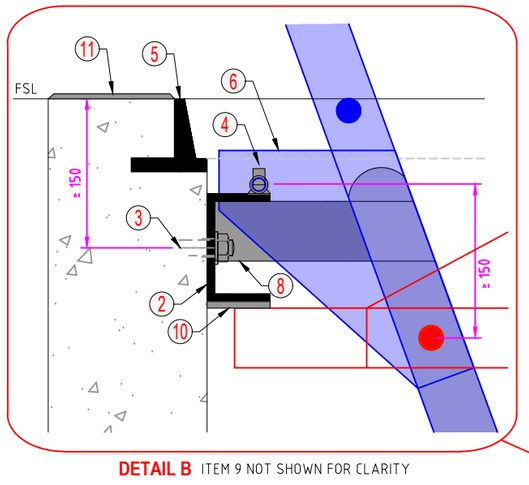


TABLE 9: ITEMS SCHEDULE

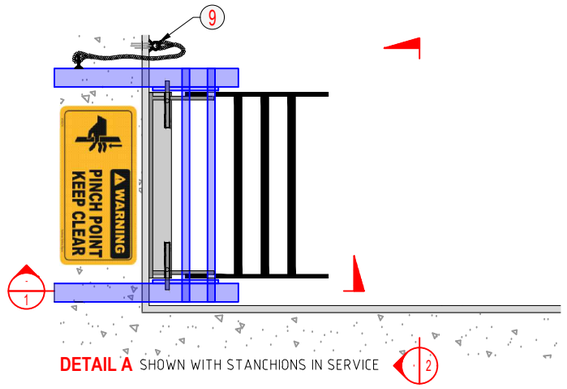
	ITEM	DETAILS
1	FIXED LADDER	REFER SHEET 3
2	ATTACHMENT CHANNEL	150 X 75 X 6
3	FASTERNERS	3 NO. FOR ITEM 2. 1 EACH FOR BOTTOM OF ITEM 1. REFER MRWA SEWERAGE STANDARD FIGURE 314-F OR G
4	BARREL BOLT	HEAVY DUTY 316SS WITH Ø12mm BOLT AND LOADED SPRING, FULLY WELDED IN PLACE
5	FRAME FOR COVERS	REFER AM2757 COVERS STANDARD
6	ROTATING STANCHION BEARING & LATCHING PLATE	2 NO. 10 THICK. SHAPE AS SHOWN WITH Ø12.5mm HOLE FOR BARREL BOLT INSERTION. WELD TO ROTATING STANCHION
7	ROTATING STANCHION	2 NO. DN50 SCH40S PIPE WITH END CAPS
8	FIXED LADDER SUPPORT BRACKET	2 NO. 12 X 50
9	EYEBOLT AND LIFTING CHAIN	SS316. Ø20 EYEBOLT AND 3mm WELDED LINK CHAIN
10	RUBBER CUSHION	MEDIUM DENSITY NEOPRENE, 6mm THICK. CONTACT ADHESIVE APPLIED TO ITEM 2
11	PINCH POINT WARNING SIGN	200mm x 100mm POLYPROPYLENE. ATTACH TO TOP OF PIT WALL WITH CONTACT ADHESIVE

FABRICATION

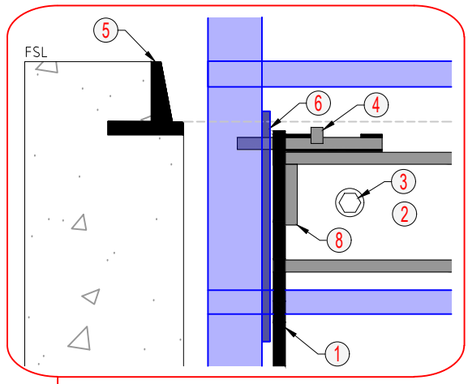
- ALL WELDS SHALL ≥6mm FILLET WELDS OR AS WIDE AS PRACTICABLE, TO AS 1554.6
- REFER TO THE FABRICATION SPECIFICATION IN SHEET 1



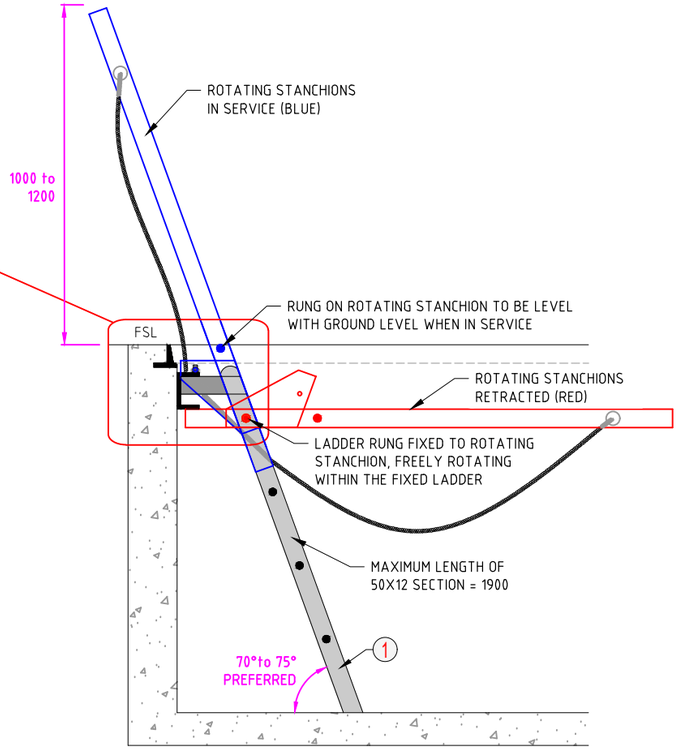
DETAIL B ITEM 9 NOT SHOWN FOR CLARITY



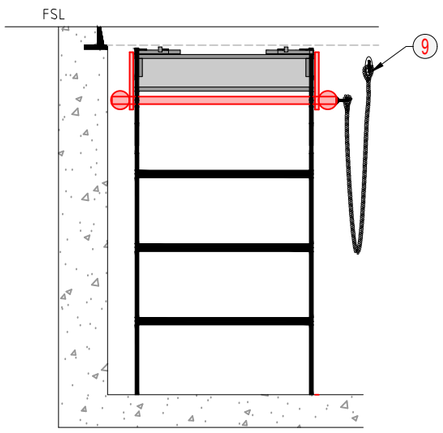
DETAIL A SHOWN WITH STANCHIONS IN SERVICE



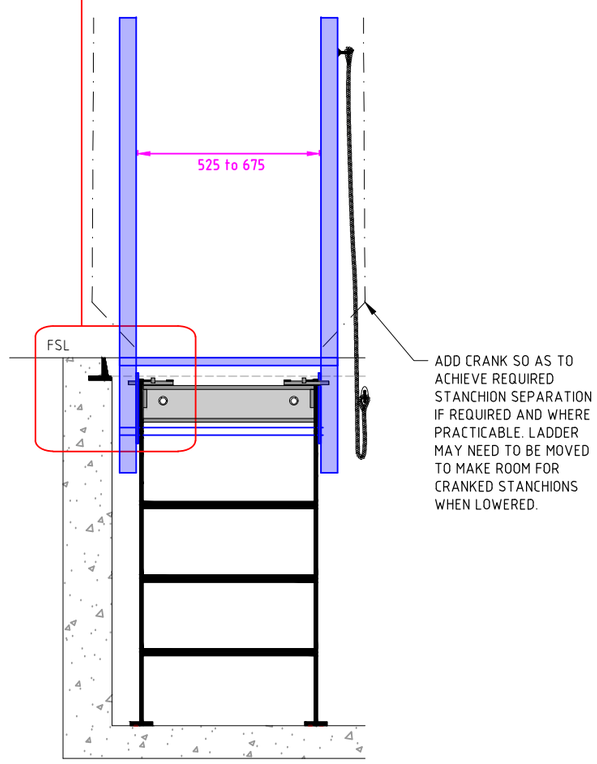
DETAIL C



SECTION 1



SECTION 2 SHOWN WITH STANCHIONS RETRACTED



SECTION 2 SHOWN WITH STANCHIONS IN SERVICE

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APP'D	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

DESIGNER: R. JAGGER | DRAFTER: R. JAGGER | SEW PROJECT MANAGER: J. MCKIMMIE
DESIGN REVIEW: M. LOWE | DRAFT CHECK: S. PHILLIPS | ASSET/ENG. MANAGER: R. FERNANDO
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T : 61 3 9552 3000 F : 61 3 9552 3001 E : info@sew.com.au

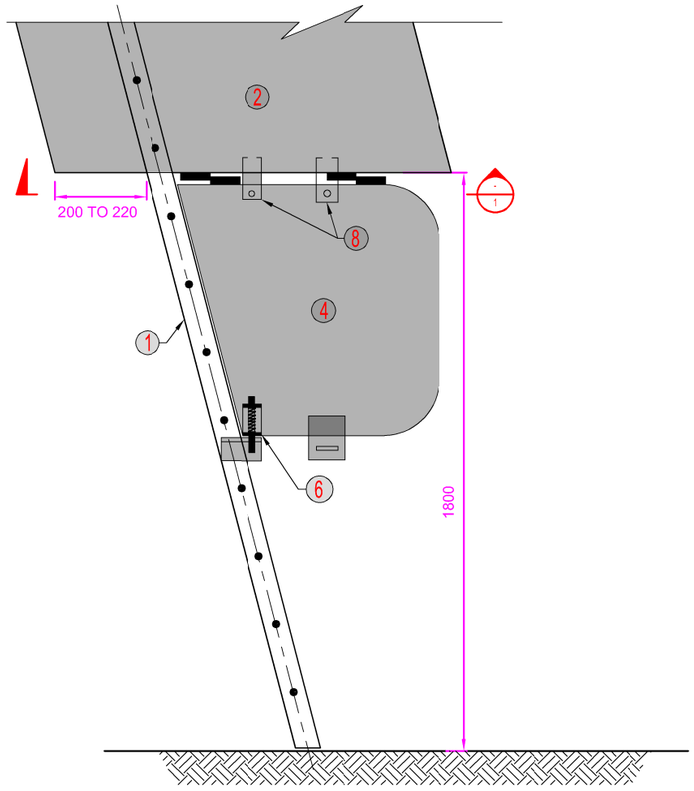
SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD

ROTATING STANCHION DETAILS

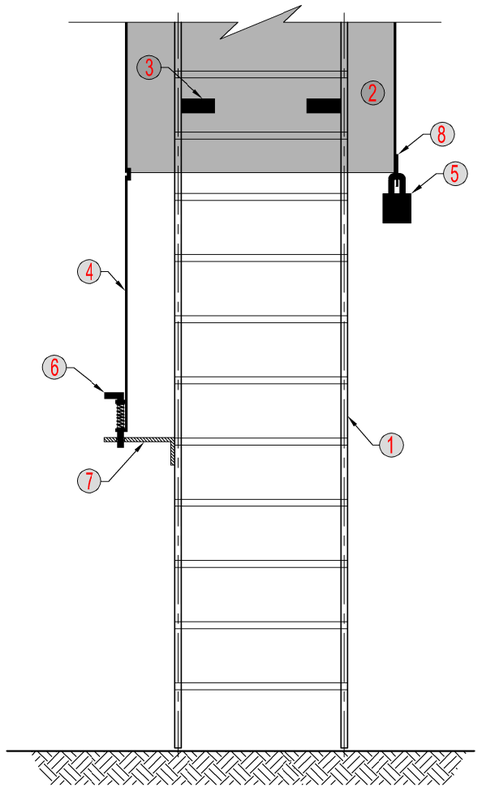
DATUM: NA | MELWAY REF: NA | SCALE: NTS | SHEET SIZE: A1
SEW DRAWING NUMBER: AM2922- SHEET 5 | REV: B
SEW JOB No:

CAD FILE NAME: C:\Users\jmckimmi\Downloads\SEW Fixed Ladder and Stairway Standard 11.dwg
Plotted @ 13/1/2026 12:09pm by jmckimmi

FIGURE 7: LOCKED HATCH CLIMB PREVENTION ARRANGEMENTS



ELEVATION
(SHOWN HATCH OPEN)



END ELEVATION
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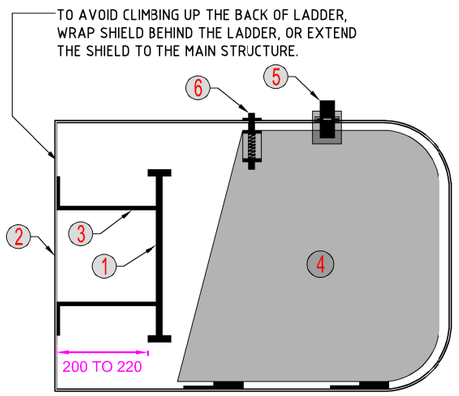
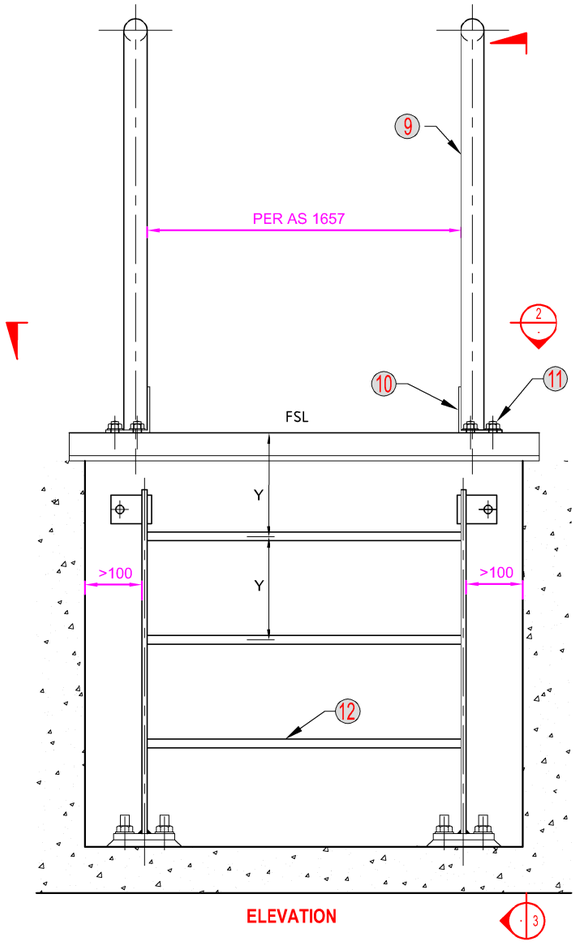


SECTION 1
(SHOWN HATCH CLOSED,
LOOKING FROM UNDERNEATH)

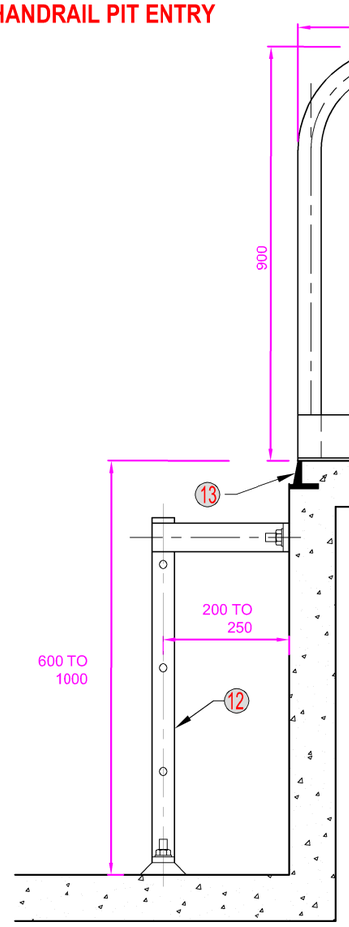
TABLE 10: ITEMS SCHEDULE

	ITEM	MATERIALS / DETAILS
1	LADDER	REFER SHEET 3
2	SHIELD	REFER SHEET 1 AND 2
3	SHIELD AND/OR LADDER MOUNTING BRACKET	FIX BRACKETS TO LADDER TO MINIMISE HAND GRIP INTERFERENCE WHILST USING LADDER
4	HATCH AND HINGES	REFER SHEET 1 AND 2. HATCH 3mm THICK ALUMINIUM CHECKER PLATE
5	SEW LOCK	PROVIDE PLATE SHIELD FOR LOCK
6	SPRING LOADED LATCH	SS316, INSULATED FROM ANY DISSIMILAR METALS
7	LATCH RESTRAINT BRACKET	WELD TO LADDER. DRILL HOLE ⌀5mm OVERSIZED TO RECEIVE LATCH PIN
8	LUGS FOR LOCK AND LATCH	2 NO. FITTED TO SHIELD. ±5 THICK PLATE

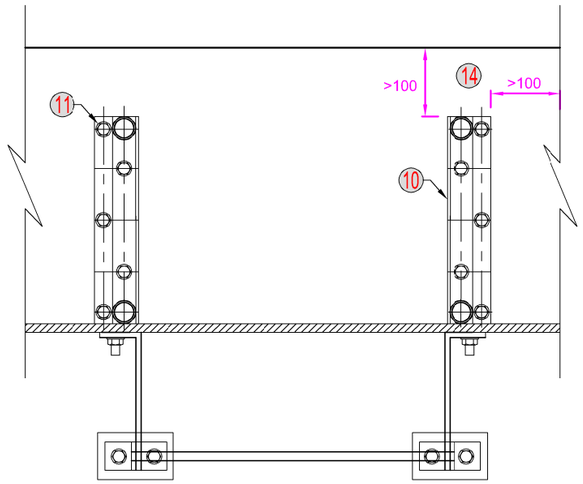
FIGURE 8: FIXED HANDRAIL PIT ENTRY



ELEVATION



SECTION 3



SECTION 2

TABLE 11: ITEMS SCHEDULE

	ITEM	DETAILS
9	HANDRAIL	⌀50 X 3 THICK TUBE. A POST MAY BE PROVIDED WHERE INSUFFICIENT SPACE FOR THE SHOWN HANDRAIL
10	SUPPORT ANGLE	100 X 100 X 6
11	FASTERNERS	5 NO. EACH SIDE, M12 X 100
12	LADDER	REFER SHEET 3
13	FRAME FOR COVERS	REFER AM2757 COVERS STANDARD
14	HARDSTAND AREA	EXTEND >100 BEYOND EXTENT OF HANDRAIL FOOTPRINT AND AS REQUIRED BY AM2757

REV	DESCRIPTION	JOB No	DRAFTER	DES. REVIEW	PM. APPD	DATE
B	PUBLISHED FIRST VERSION					JAN 26
A	ISSUED FOR DISCUSSION					FEB 23

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SOUTH EAST WATER
AM2922 - FIXED LADDER & STAIRWAY STANDARD
CAGE LOCKED HATCH, AND
PERMANENT ABOVE GROUND HANDRAIL DETAILS

DATUM: NA
MELWAY REF: NA
SCALE: N.T.S
SHEET SIZE: A1
SEW DRAWING NUMBER
AM2922- SHEET 6
REV: B
SEW JOB No:

CAD FILE NAME: C:\Users\jmckimmi\Downloads\SEW Fixed Ladder and Stairway Standard (1).dwg
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