



DBSA SCHOOLS PROJECT

TYPICAL DETAILS AND SPECIFICATIONS BOOKLET REV.P2

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PRELIMINARY

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INDEX

SECTION 1 : GENERAL SPECIFICATIONS

- Sk 100 – Repairs to Existing Roof Sheetting
- Sk 101 – Replacement of Damaged Roofs and Trusses
- Sk 102 – Replacement of Damaged Ceilings and Cornices
- Sk 103 – Replacement of Damaged Sisalation
- Sk 104 – Concrete Mix Design for 20MPa and 25MPa Concrete
- Sk 105 – Gutters and Downpipes Specification
- Sk 106 – Glazing Specification
- Sk 107 – Roof Sheetting Paint Specification
- Sk 108 – General Specifications : New Doors
- Sk 109 – Roof Truss Inspection Specification

SECTION 2 : STRUCTURAL TYPICAL DETAILS AND SPECIFICATIONS

- Sk 300 – External Concrete Channel Detail
- Sk 301 – Walkway Roof Support : Steel Post Detail
- Sk 302 – External Door Threshold Detail (E.D.T.)
- Sk 303 – Thickening in Surface Bed for 110mm Wall
- Sk 304 – Typical Saw-Cut Joint Detail
- Sk 305 – Internal Wall Connection Detail
- Sk 306 – Typical Isolation Joint Detail (I.J.)
- Sk 307 – Internal Door Threshold Detail (I.D.T.)
- Sk 308 – Typical Construction Joint Detail
- Sk 309 – Typical Edge Beam Thickening Detail
- Sk 310 – Typical Section Through Surface Bed
- Sk 311 – Typical Control Joint Detail for Brickwork
- Sk 312 – 220mm Wall Foundation Detail
- Sk 313 – Water Tank Support Detail
- Sk 314 – Timber Roof Truss Anchor Detail
- Sk 315 – General Plaster Repairs and Brickwork / Blockwork Stitching Repairs Specification
- Sk 316 – Concrete Spalling Repairs for Repairs Up to 30mm Thick
- Sk 317 – Concrete Spalling Repairs for Repairs Over 30mm Thick
- Sk 318 – Typical 345mm Full Cross Bonded Brick Retaining Wall Details
- Sk 319 – Typical Control Joint Details
- Sk 320 – Typical Underpinning Details
- Sk 321 – Repairs to Existing Concrete Surface Bed
- Sk 322 – Gutter Support Steel Post Detail
- Sk 323 – Typical Vent Pipe Setting Out on Precast Panel for Ablution Pits
- Sk 324 – Specification on Extension for Timber Rafter
- Sk 325 – Borehole Capping Detail
- Sk 328 – Typical Stone Pitched Spreader Detail
- Sk 329 – Typical Handle Detail for Precast Concrete Pit Cover Slabs
- Sk 330 – Typical Precast Concrete Staircase Details
- Sk 331 – Typical Concrete Staircase Details
- Sk 332 – Typical Ramp / V-Drain Crossing Detail
- Sk 333 – Typical Ramp Retaining Wall Details

SECTION 3 : CIVIL TYPICAL DETAILS AND SPECIFICATIONS

- Sk 900 – Typical Stormwater Manhole and Pipe Bedding Details
- Sk 901 – Typical Stormwater Headwall Details
- Sk 902 – Scour Protection at RWDP Outlet
- Sk 903 – Typical Sub-Surface Drainage Details
- Sk 904 – Typical Handrail Details
- Sk 905 – Typical Dry-Stack Retaining Wall Details
- Sk 906 – Typical Kerbing Details
- Sk 907 – Typical Stormwater Surface Channel Types and Installation Details
- Sk 908 – Typical Galvanised Steel Palisade Fencing Details
- Sk 909 – Typical Precast Concrete Palisade Fencing Details
- Sk 910 – Typical Wire Mesh Fencing Details
- Sk 911 – Typical Gabion Retaining Wall Details
- Sk 912 – Typical Block Paving / Precast Concrete Paving Layerworks Details
- Sk 913 – Material Properties for Layerworks
- Sk 914 – Typical Stormwater Soak Away Details
- Sk 915 – Urinal to Boys Ablution
- Sk 916 – Typical Infiltrator Soakaway Detail for Urinals
- Sk 917 – Typical Sewer Manhole Detail
- Sk 918 – Typical Soakaway Detail for Urinal and WHB Discharge
- Sk 919 – Typical Stormwater Soakaway Detail
- Sk 921 – Typical 600mm x 600mm Manhole Detail



SECTION 1

GENERAL SPECIFICATIONS

REPAIRS TO EXISTING ROOF SHEETING

1. Prepare and clean existing surface where the roof appears to be leaking.
2. Apply a generous coat of Sika Rain Tite (or equally approved) waterproofing agent by brush or roller.
3. Embed the membrane into the base coat while it is still wet.
4. Remove and smooth out air pockets and creases.
5. Apply a second coat of the waterproofing agent onto the membrane.
6. When touch dry, apply an additional coat of the waterproofing agent.
7. Repaired area of roof sheeting to be painted with 2 coats of paint. Colour to match existing roof sheeting.

NOTE: REFER TO MANUFACTURER'S SPECIFICATIONS FOR APPLICATION REQUIREMENT OF WATERPROOFING AGENT.

A. ASBESTOS ROOF SHEETING

- Any person who erects, maintains, alters, renovates, repairs or dismantles asbestos roof sheeting, gutters, fascia boards and barge boards shall ensure that:
 - Written work procedures are laid down and followed to prevent the release of asbestos dust into the environment.
 - All run-off water must be filtered before entering the stormwater system.
 - Full compliance with the department of labour requirements in terms of the safe removal and/or the safe repair (patching) of the asbestos roof sheeting.
 - Notification in terms of an 'asbestos plan' must be submitted to an approved inspection authority and then to the department of labour for approval prior to working on any asbestos roof sheeting.
- If any holes on the sheeting are larger than 75mm x 75mm or otherwise severely damaged or cracked in many areas of the sheet, then the existing asbestos roof sheet must be removed and replaced with 'nutec' fibre cement roof sheeting. Profile and colour to match the existing roof sheeting. Refer to item 1 above for the department of labour requirements for the safe handling of asbestos sheeting.
- When removing and replacing the entire asbestos roof sheeting with 'Nutec' roof sheeting, ensure that the new timber purlins are 76 x 50 Grade 5 Type SA Pine timber with the 76mm dimension placed vertically. Note : purlin spacing should not exceed 900mm centres. the use of 76 x 50 Grade 5 Type SA Pine timber purlins are only acceptable when truss spacings do not exceed 1200mm centres. Where truss spacings exceed 1200mm centres, the contractor is to engage the Engineer for further recommendations.

B. STEEL ROOF SHEETING

- Sheeting specification for a complete new roof: use 0,53mm COLOUR BOND or 0,55mm COLOUPLUS (AZ150) IBR profile sheeting, supplied in single lengths (from roof ridge to eaves gutter) fixed onto 76 x 50 Grade 5 Type SA Pine timber purlins with the 76mm dimension placed vertically. Note : Purlin spacing should not exceed 900mm centres. The use of 76 x 50 grade 5 type sa pine timber purlins are only acceptable when truss spacings do not exceed 1200mm centres. Where truss spacings exceed 1200mm centres, the Contractor is to engage the Engineer for further recommendations.
Colour of the new sheeting to match the roof sheeting on existing classroom blocks or otherwise directed by project manager.
- Minor damage to existing steel roof sheeting: Remove and replace damage roof sheeting with new steel sheeting. New sheeting to match the existing sheeting profile, type, overall thickness and colour. Sheetting to be supplied in single lengths (from roof ridge to eaves gutter).

C. CONCRETE ROOF TILES

- All damaged and cracked concrete roof tiles are to be removed and replaced with new concrete tiles to match the existing roof tiles. Colour of the new concrete tiles to match the existing roof tiles.

D. DAMAGED ROOF TRUSSES REPLACED WITH COMPLETE NEW 'GANG NAILED' ROOF STRUCTURE

- Existing damaged timber roof trusses to be remove and carted of site.
- The installation of the gang-nailed roof structure by the main contractor is to be : **A design, supply, install and certify** contract.
- It is the responsibility of the main contractor to submit the required TR1 and TR2 certificates to us for our records at the relevant stage of the project. The TR1 and TR2 certificates certify that the overall roof structure is structurally stable.
- It is the responsibility of the main Contractor to ensure that the approved competent person (registered with ECSA) issuing the TR2 certificate has inspected the site, complied with all the required specifications as noted above, and has provided his own specifications / drawings for the truss tie-downs, bracing, etc.
- The TR1 certificate confirms that the gang-nailed roof trusses have been designed by an approved competent person (registered with ecsa) and the TR2 certificate confirms that the installation of the gang-nailed roof trusses on site has been inspected, checked for compliance with the roof truss shop drawings and approved by an approved competent person (registered with ECSA).

DAMAGED CEILINGS AND CORNICES

1. Remove damaged ceiling and cart rubble off site.
2. Prepare surface to receive new ceiling.
3. Construct new ceiling with 9.5mm thick gypsum board. 44mm x 10mm timber cover strip or 'plastic m-strip' to be installed at ceiling joints. All to be installed according to manufacturer's specifications.
4. Construct ceiling cornices with Nutec Everite 75mm coved cornices. All to be installed according to manufactures specifications.
5. All ceiling boards to be fixed onto new 38mm x 50mm (with 50mm dimension placed vertically) Grade 5 SA Pine timber battens. battens spacing to be max. 400mm c/c.
6. all materials to be SABS approved.

RECOMMENDED TIMBER BATTEN SIZES FOR 9.5mm thk. GYPSUM CEILING BOARDS	
TIMBER JOIST / TRUSS SPACING	TIMBER BATTEN SIZE
< 1000mm	38mm x 38mm Grade 5 SA Pine
1001mm to 1200mm	38mm x 50mm Grade 5 SA Pine (with 50mm dimension placed vertically)
1201mm to 1400mm	50mm x 76mm Grade 5 SA Pine (with 76mm dimension placed vertically)
> 1401mm	Consult with appointed Structural Engineer.

REPLACEMENT OF SISALATION :

1. Remove existing roof sheeting and store for re-use or to be assessed (by the appointed structural engineer) on site if roof sheeting needs to be replaced.
2. Install multipurpose roof sisalation. Specification - sisalation multipurpose light duty 439. All to be installed according to manufacturer's specification.
3. Re-install or replace roof sheeting as required / instructed by the appointed Structural Engineer.
4. All material to be SABS approved.

BATCHING AND MIXING OF CONCRETE:

- 1 bag of cement has a volume of 33 litres.
- 1 builders wheelbarrow has a volume of 65 litres, which is equivalent to 2 bags of cement.
- Do not split bags when batching except for small or no structural work.
- Use a concrete mixer or hand mixer on a dry, clean, non-absorbent surface.
- When mixing concrete by hand, first mix the cement, sand and water thoroughly and mix the stone last - this saves a lot of effort.
- Mix until colour and workability is uniform.
- All concrete to be vibrated when placing.
- Concrete cube test results to be submitted to the engineer as per below:
 - > 3No. cubes tests for 7 day results
 - > 3No. cubes tests for 28 day results

CONCRETE STRENGTH	CEMENT (50KG BAGS)	SAND (WHEELBARROWS)	STONE (WHEELBARROWS)	WATER (LITRES)
20 MPa	2	4	4	55
25 MPa	2	3	3	55

TYPICAL CONCRETE MIX DESIGN

GUTTERS AND DOWNPIPES

1. GUTTERS AND DOWNPIPES TO A COMPLETELY NEW ROOF :

ALL GUTTERS TO BE SEAMLESS 110mm HALF ROUND uPVC GUTTERS – ALL TO SUPPLIER'S SPECIFICATIONS.
DOWNPIPES TO BE 75mm DIAMETER uPVC DOWNPIPES, ALL FIXED AS PER SUPPLIER'S SPECIFICATIONS.
NOTE: GUTTER BRACKETS ARE TO BE FIXED AT A MAXIMUM OF 750mm CENTRES.

2. GUTTER SUPPORT :

NUTEC FASCIA BOARDS (OR EQUALLY APPROVED) ARE TO BE FIXED (AT MAXIMUM 750mm CENTRES) TO A 114x38 (GRADE 5) SA PINE TIMBER CLOSURE PIECE OF WHICH IS FITTED AT THE GUTTER END OF THE VERANDAH OVERHANG AND BETWEEN ALL ROOF TRUSSES TO SUPPORT THE NEW FASCIA BOARD AND GUTTERS.

3. COMPLETE DAMAGE TO ALL EXISTING ALUMINIUM GUTTERS AND DOWNPIPES ONLY :

INSTALL NEW GUTTERS AND DOWNPIPES AS PER ITEM 1 ABOVE.

4. MINOR DAMAGE (IN SMALL SECTIONS) TO EXISTING GUTTERS AND DOWNPIPES (PVC, NUTEC, ALUMINIUM, ETC.) :

REMOVE ONLY THE DAMAGED SECTIONS OF GUTTERS AND DOWNPIPES AND REPLACE WITH NEW GUTTERS AND DOWNPIPES TO MATCH EXISTING IN MATERIAL, PROFILE, TYPE AND COLOUR.

REPLACING GLAZING

1. REMOVE EXISTING PUTTY.
2. RUB THE WINDOW FRAME WITH A WIRE BRUSH TO REMOVE ANY REMAINING GLAZING PUTTY OR OLD CAULK FROM THE GROOVES.
3. SAND THE WINDOW FRAME LIGHTLY WITH GRIT SANDPAPER TO REMOVE STUCK-ON CAULK, PUTTY OR WOOD SPLINTERS.
4. ALIGN THE GLAZING WITH THE GROOVE IN THE FRAME AND PUTTY INTO PLACE.
USE 4mm thk. (SABS APPROVED) CLEAR GLAZING FOR ALL WINDOWS.
5. HOLD A METAL PUTTY KNIFE AT A LOW ANGLE TO THE WINDOW FRAME AND PUSH THE KNIFE ALONG THE WINDOW FRAME TO REMOVE THE EXCESS PUTTY.

ROOF SHEETING PAINT SPECIFICATION

1. EXISTING ASBESTOS ROOF AND EXISTING FIBRE CEMENT ROOF:

Existing asbestos roof covering and fibre cement roof covering & associated rainwater products to be high pressure power cleaned or in some circumstances scrubbed clean. Apply 2 coats 'Dulux Roofguard' exterior roof coating with Solarflex properties.

2. EXISTING GALVANISED STEEL ROOF:

Please ensure surfaces are sound, clean and have been correctly prepared using appropriate primers where relevant. Then apply 2 coats of 'Dulux Roofguard' Exterior roof coating with Solarflex properties.

Application to be with a brush or roller. Re-coat after 4 hours. Touch dry after 1 hour.

Please note coverage may vary according to surface porosity.

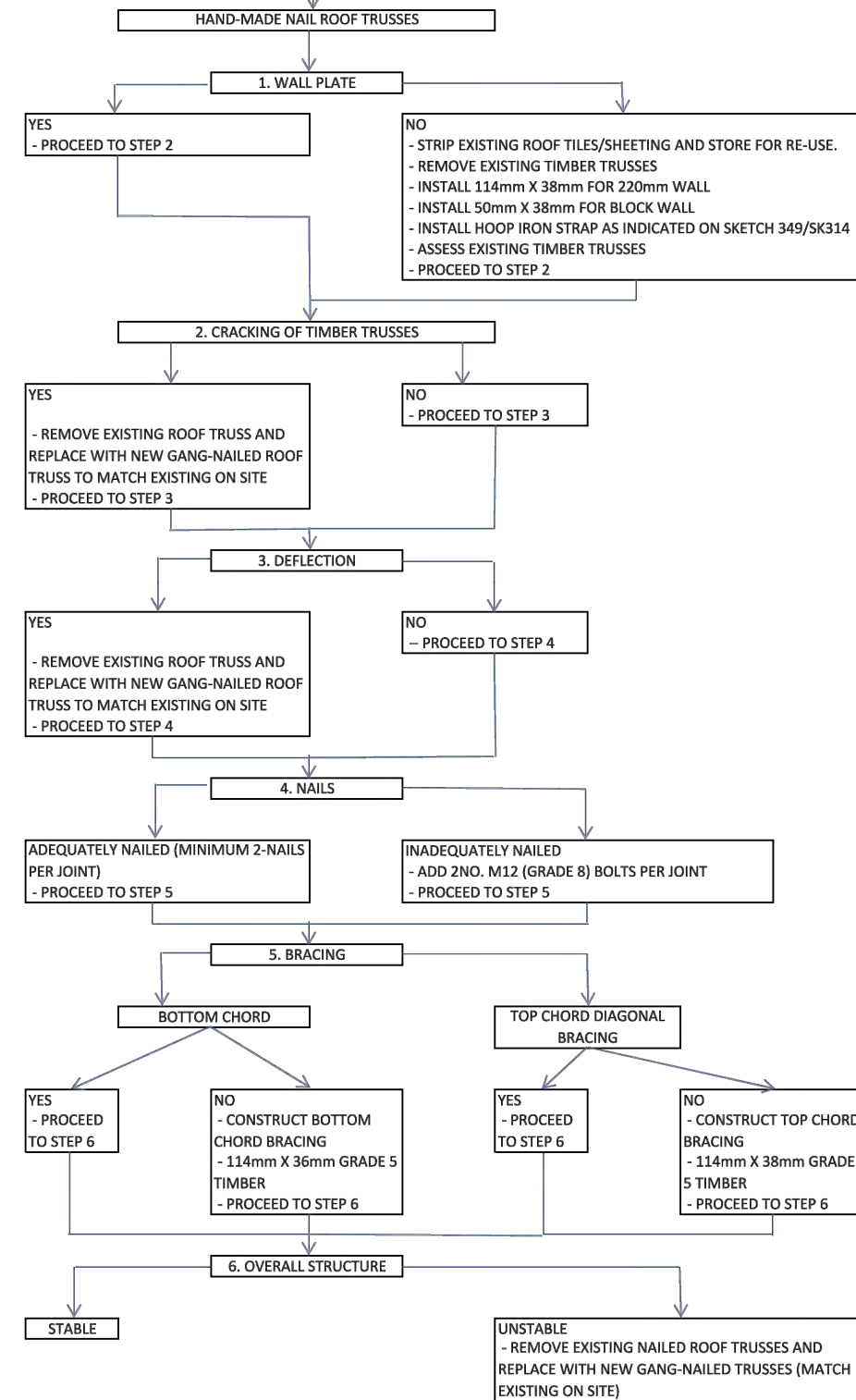
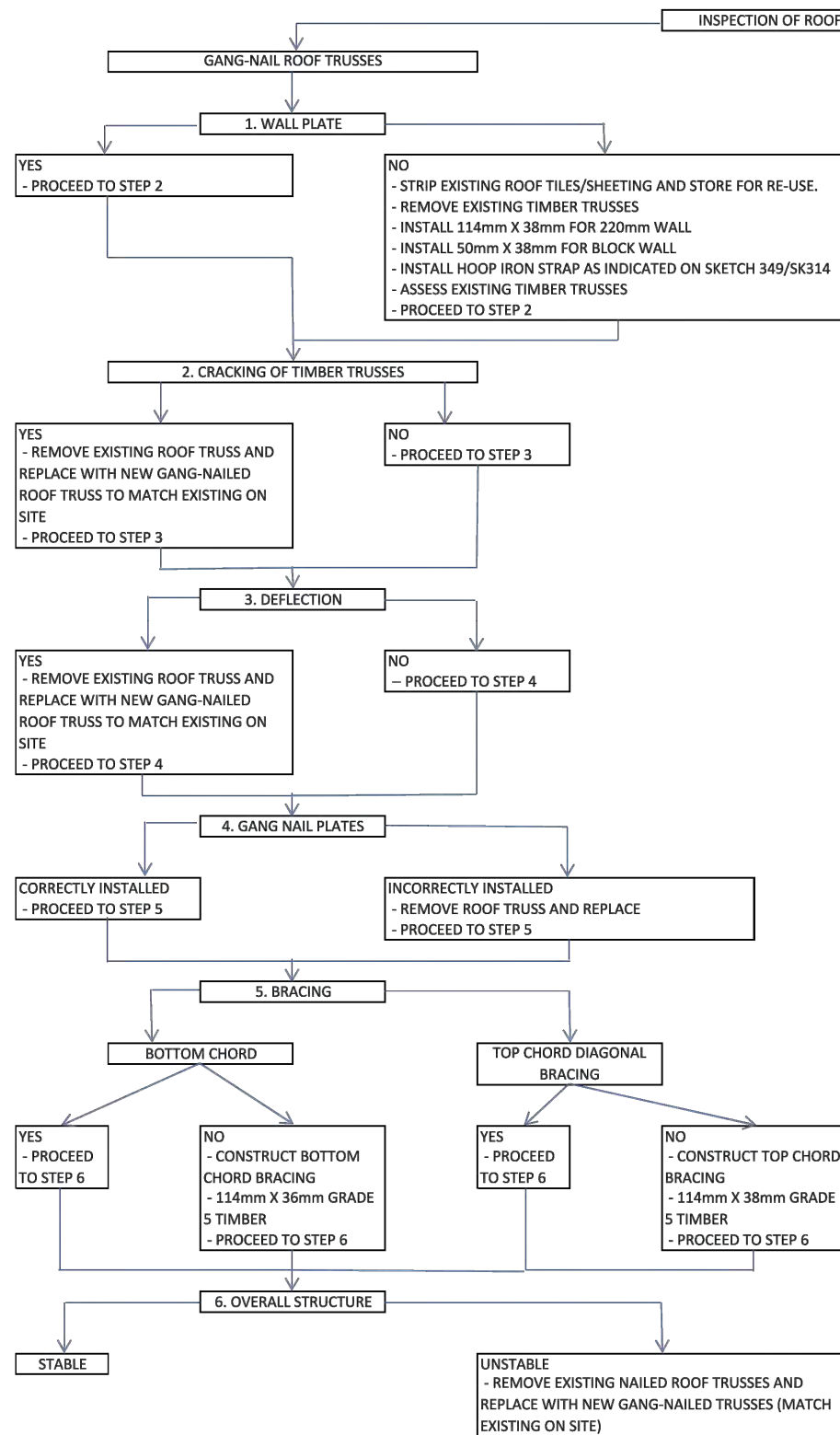
NEW DOORS

1. DOOR FRAMES

Galvanised stock steel double rebated door frames (1.2mm thick) for 115mm and 230mm walls - not painted with 1 pair of 100mm galvanised steel loose-pin hinges welded in position

2. DOORS

Meranti doors as per architects layout. All doors to be primed, undercoated and painted with 2 coats of gloss enamel paint.



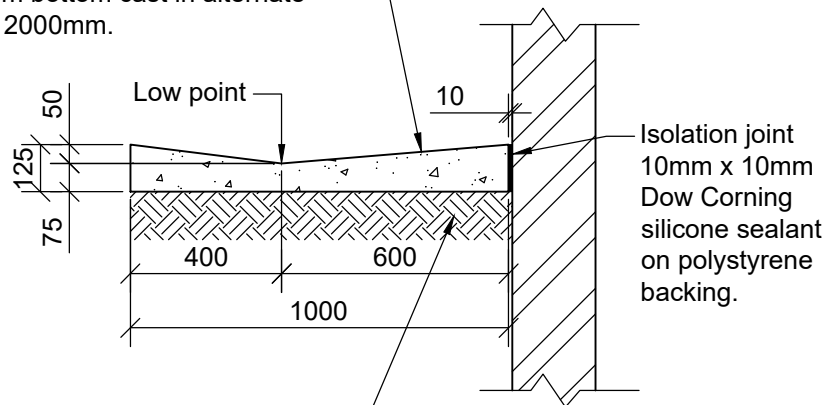


SECTION 2

STRUCTURAL TYPICAL DETAILS AND

SPECIFICATIONS

Concrete channels/apron:
125mm thk. x 20MPa concrete aprons
reinforced with mesh ref 193 placed
30mm from bottom cast in alternate
panels of 2000mm.

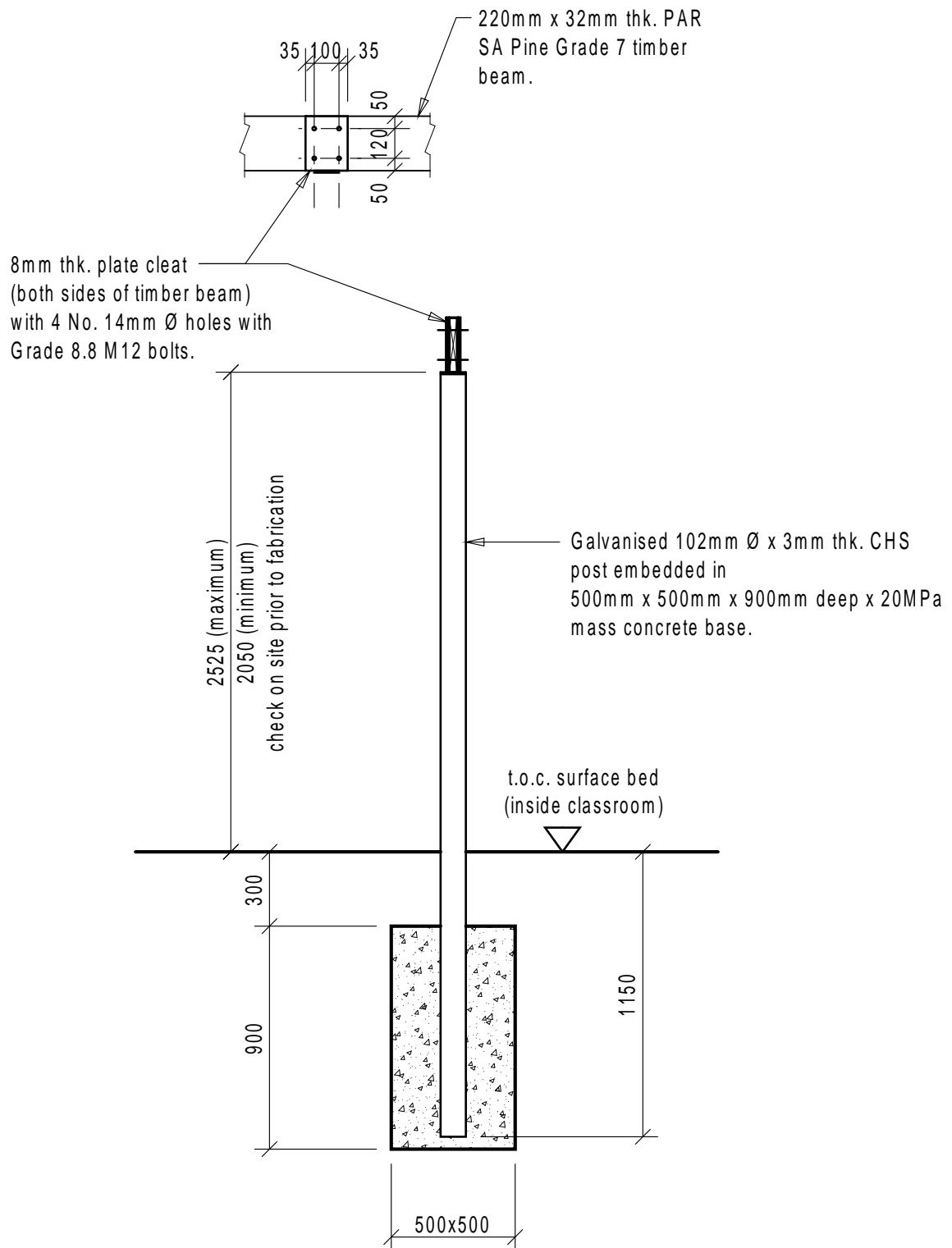


Imported fill compacted to 95% Mod
AASHTO. Compaction test results to be
submitted to the Engineer for approval
prior to casting concrete.

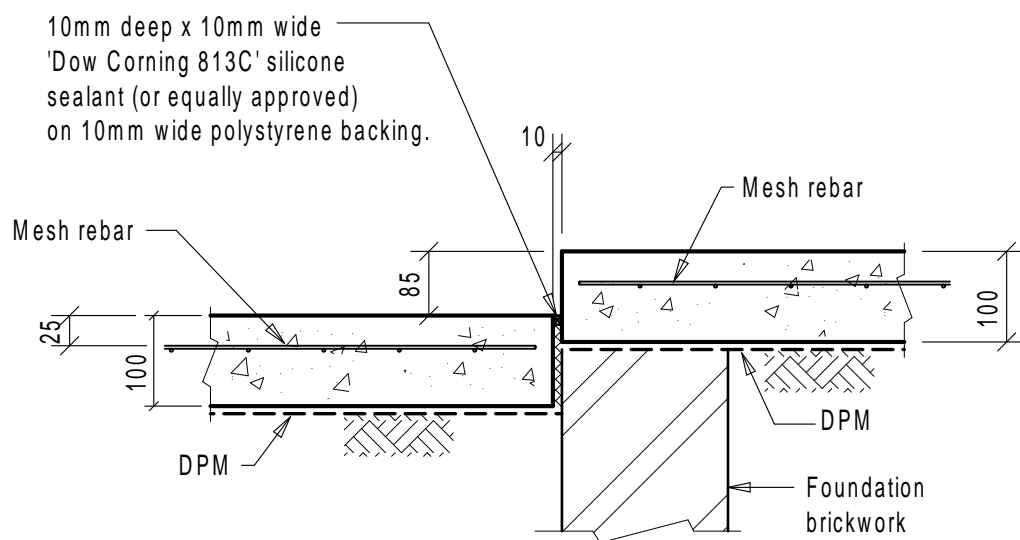
TYPICAL SECTION THROUGH V-DRAIN APRON / CHANNEL

NOTES:

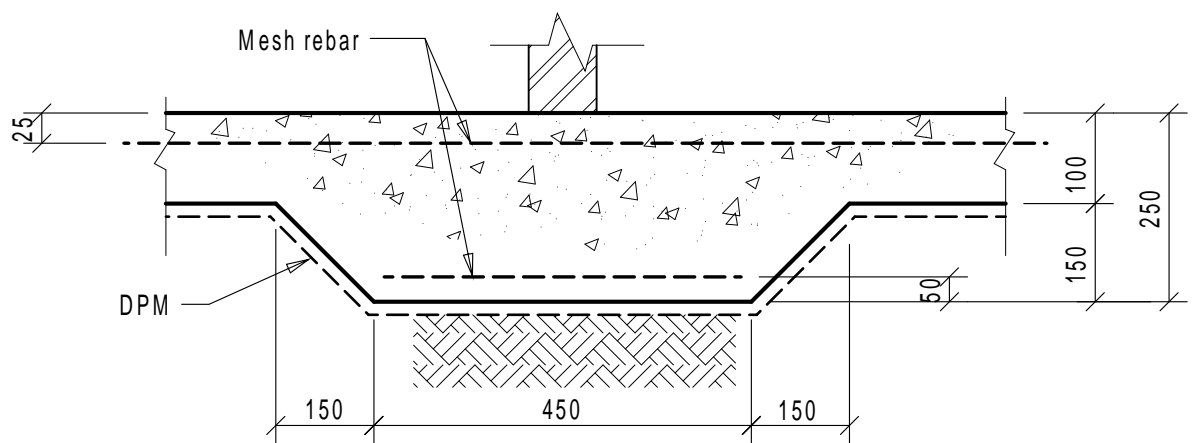
1. All v-drains must be laid to a fall at minimum grade of 1:100 to relief points.
2. Extent and positions of v-drains to be confirmed by the Engineer on site.
3. All v-drain templates are to be inspected by the Engineer prior to any work being put to hand.
4. 7 and 28 day concrete cube compressive strength test results must be provided as soon as available.
5. I.J. (Isolation joint) - 10mm x 10mm Dow Corning silicone sealant on polystyrene backing at all v-drain/building interfaces.



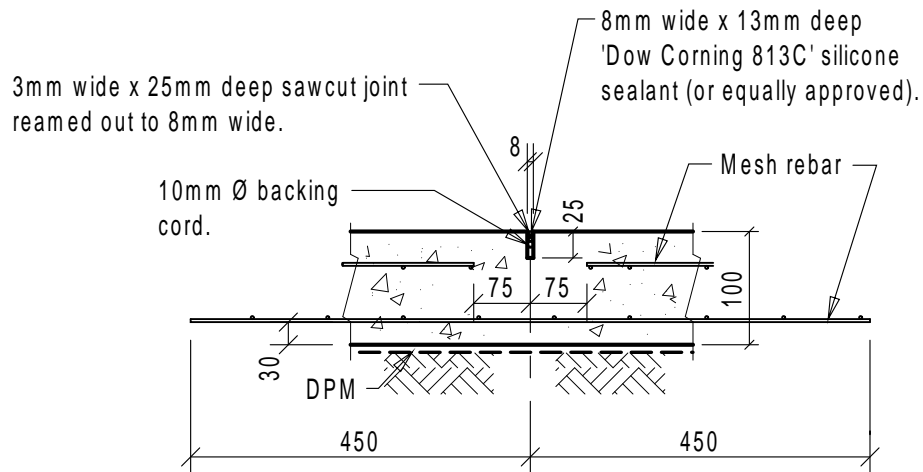
STEEL POST DETAIL



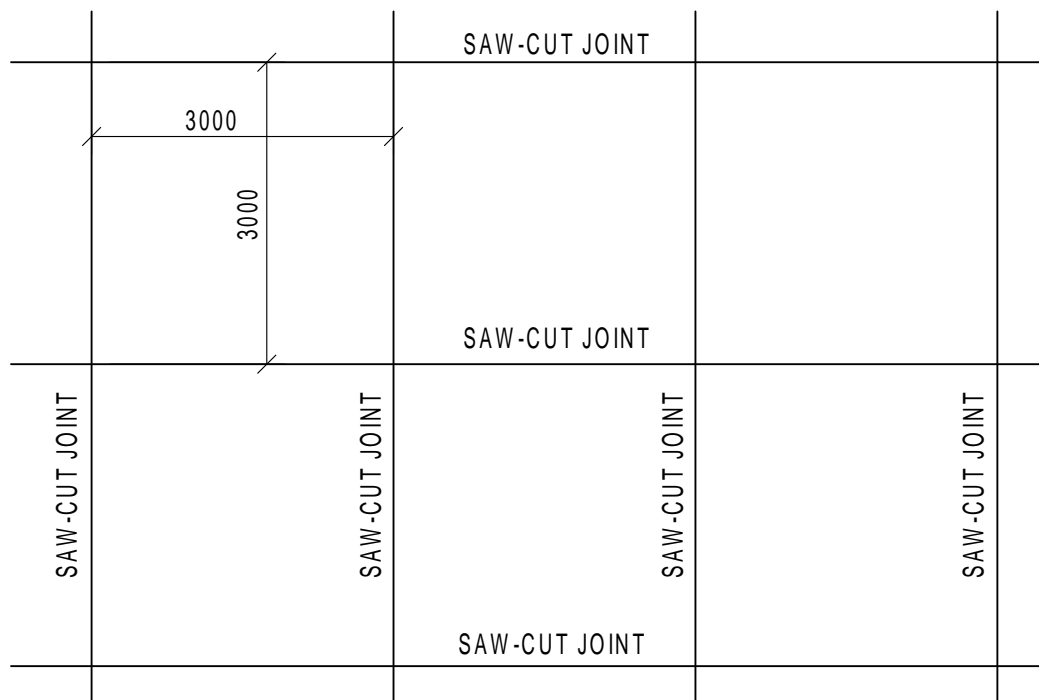
EXTERNAL DOOR THRESHOLD (E.D.T.)



THICKENING IN
SURFACE BED (TYP)

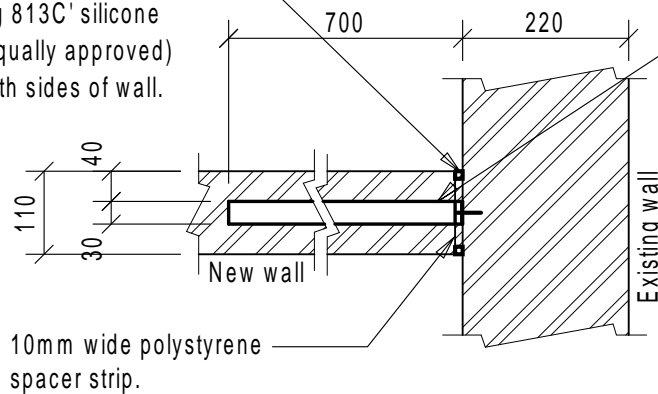


TYPICAL SAW-CUT JOINT DETAIL



JOINTS ARE AT MAXIMUM 3m CROSS CENTRES BOTH WAYS

10mm deep x 10mm wide
'Dow Corning 813C' silicone
sealant (or equally approved)
applied to both sides of wall.

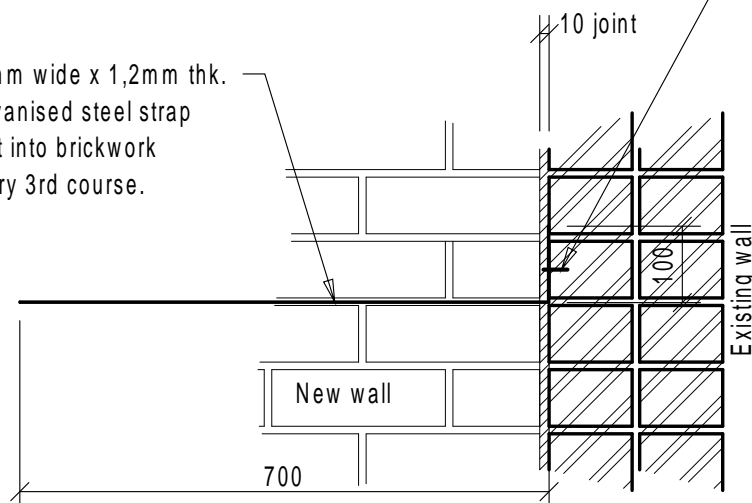


30mm wide x 1,2mm thk.
galvanised steel strap
built into brickwork
every 3rd course.

10mm wide polystyrene
spacer strip.

PLAN

30mm wide x 1,2mm thk.
galvanised steel strap
built into brickwork
every 3rd course.



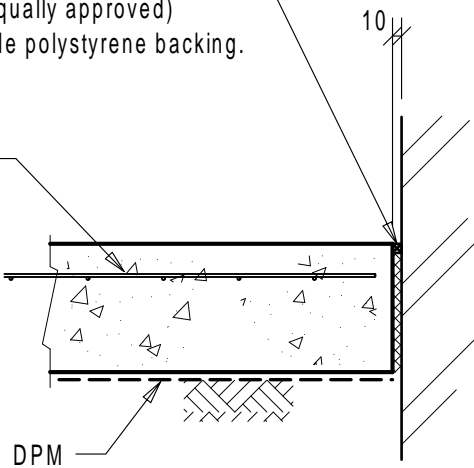
Strap fixed to connecting
wall with 'Hilti' drive pin
(or equally approved)
shot fired into existing brick wall.

ELEVATION

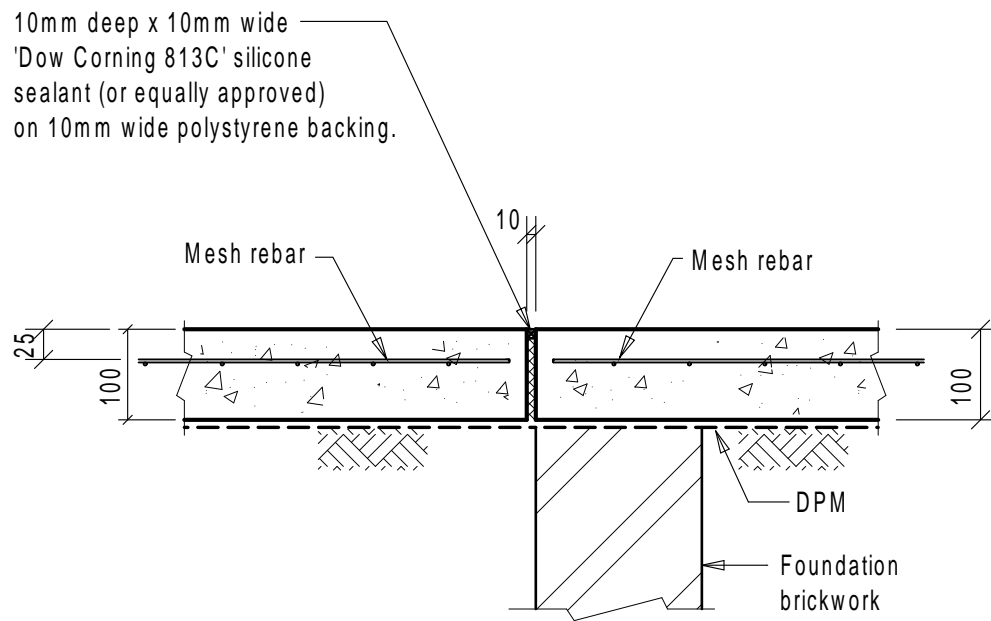
INTERNAL WALL CONNECTION DETAIL

10mm deep x 10mm wide
'Dow Corning 813C' silicone
sealant (or equally approved)
on 10mm wide polystyrene backing.

Mesh rebar



TYPICAL ISOLATION
JOINT DETAIL (I.J.)

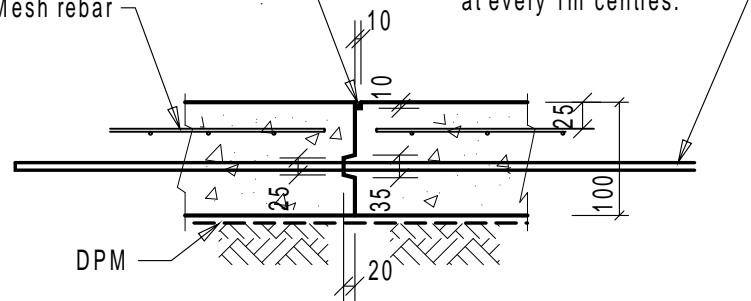


INTERNAL DOOR THRESHOLD (I.D.T.)

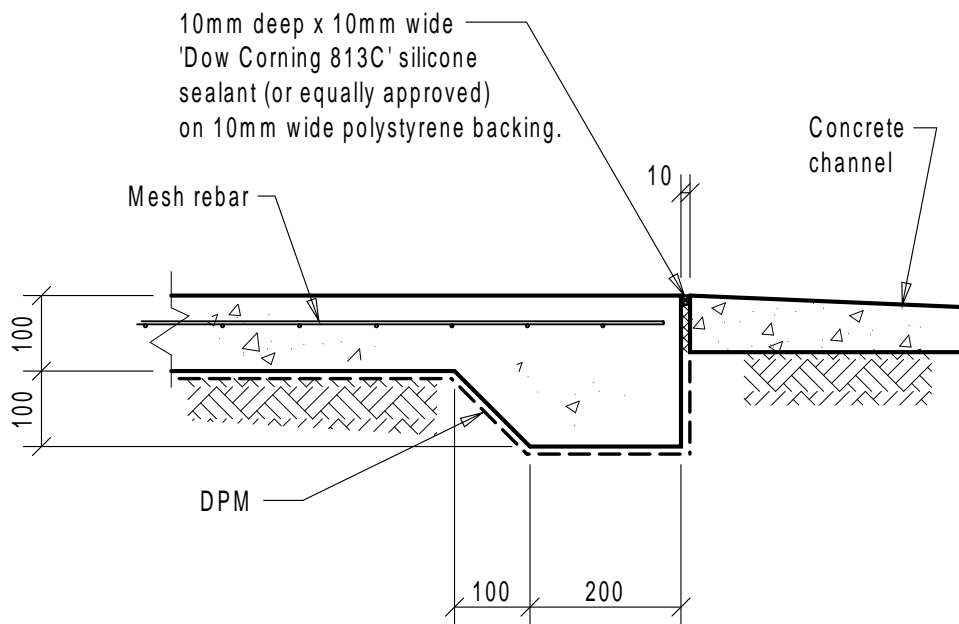
10mm deep x 10mm wide
'Dow Corning 813C' silicone
sealant (or equally approved).

Mesh rebar

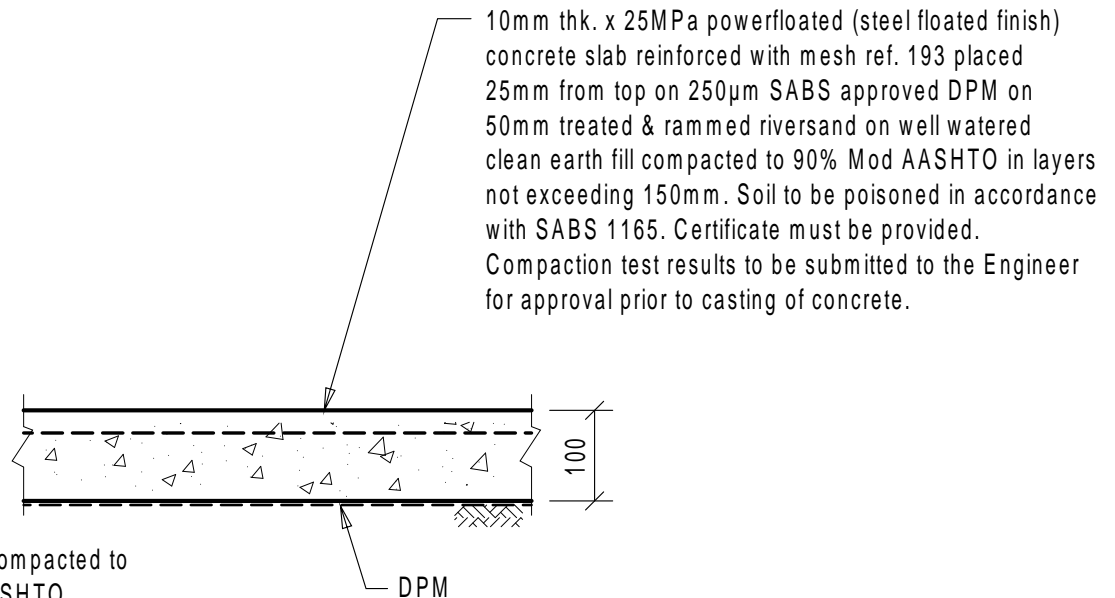
900mm long Y10 tie bar
at every 1m centres.



TYPICAL CONSTRUCTION JOINT DETAIL



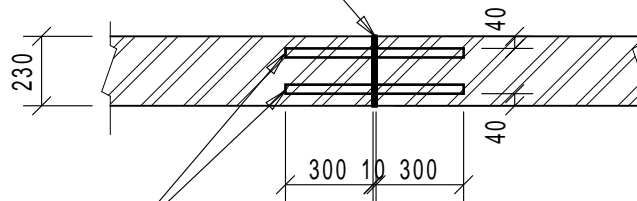
TYPICAL EDGE
THICKENING DETAIL



In-situ sub-base compacted to min. 90% Mod AASHTO. Compaction test results to be submitted to the Engineer for approval prior to casting of concrete.

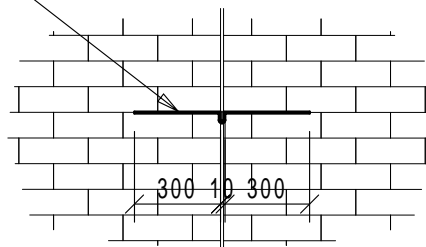
TYPICAL SECTION THRU' SURFACE BED

10mm wide polystyrene control joint sealed with 10mm deep x 10mm wide 'Dow Corning 813C' silicone sealant (or equally approved) applied to both sides of wall.



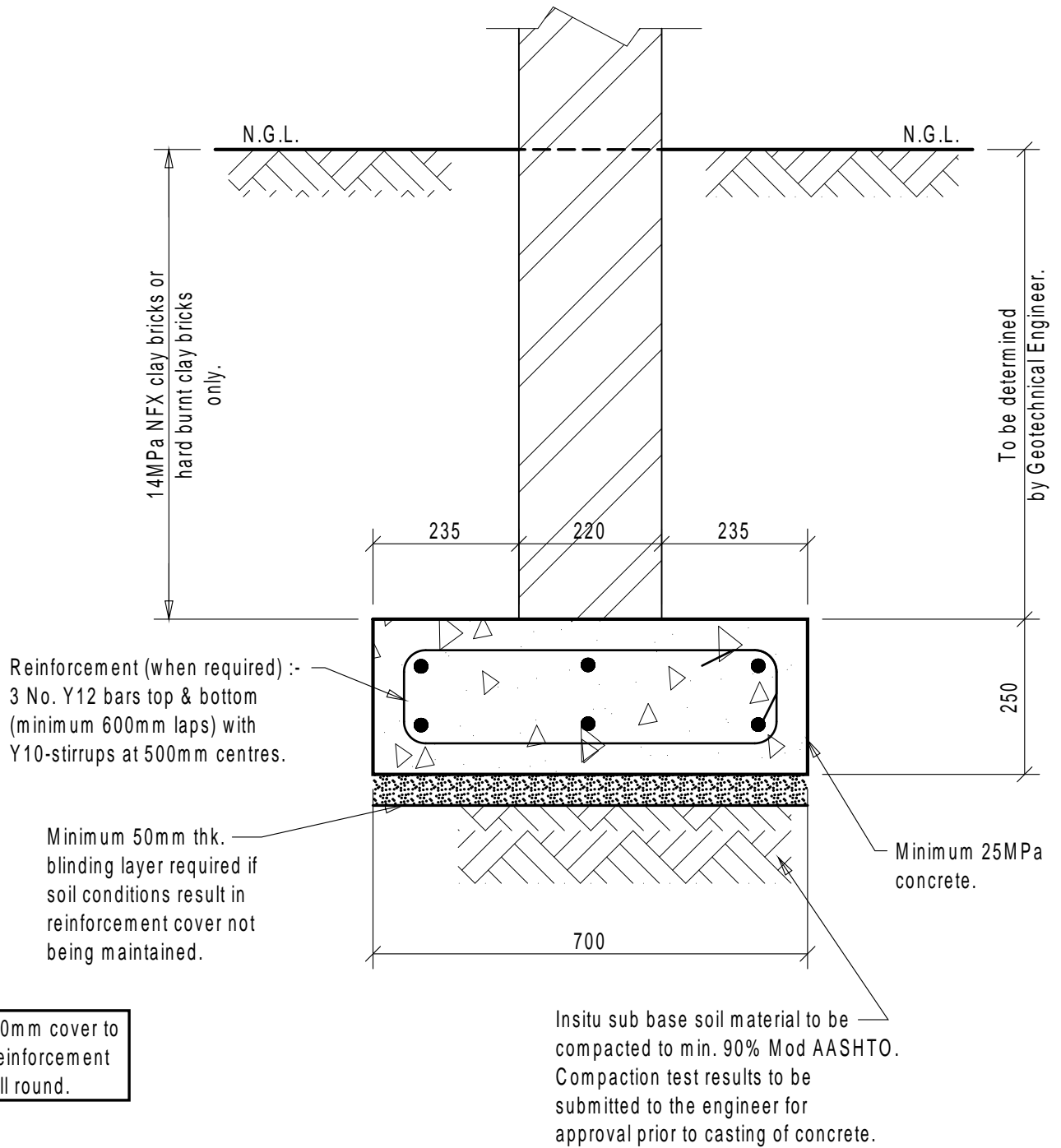
PLAN.

Concertina ties :
30mm wide x 1,2mm thk.
galvanised steel strap
built into brickwork every
3rd course.

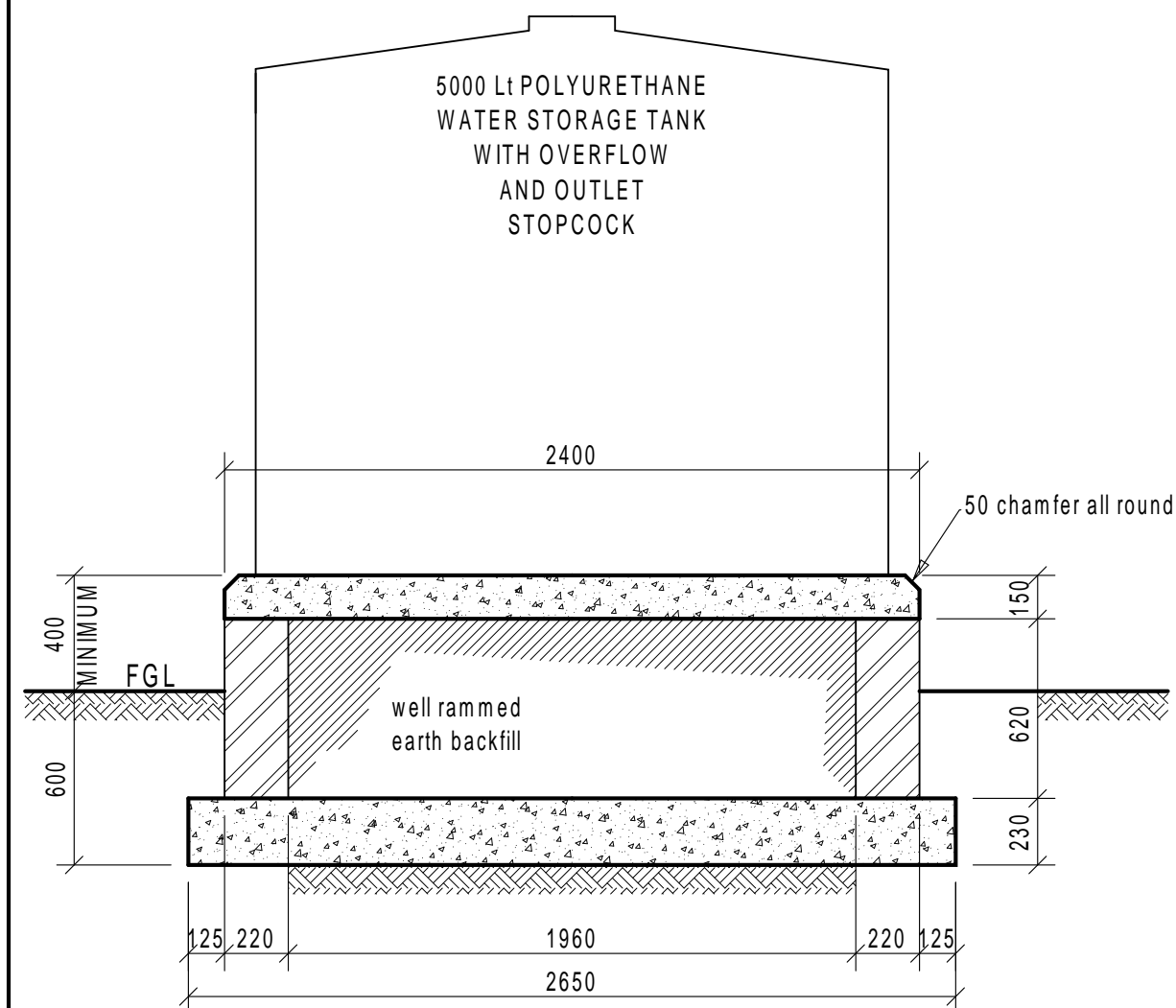


ELEVATION

TYPICAL CONTROL JOINT DETAIL FOR BRICKWORK



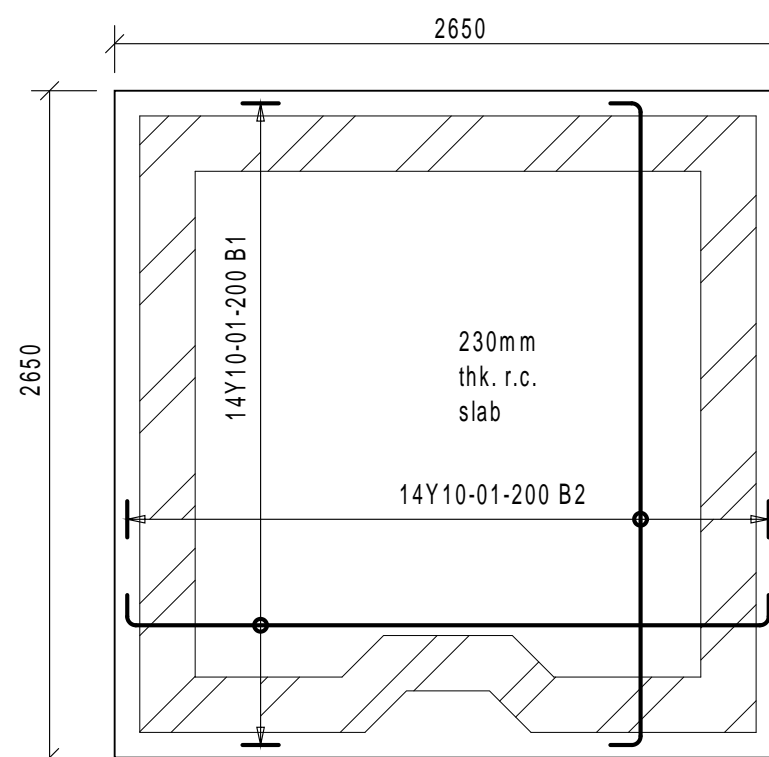
220mm WALL FOUNDATION DETAIL



TYPICAL SECTION

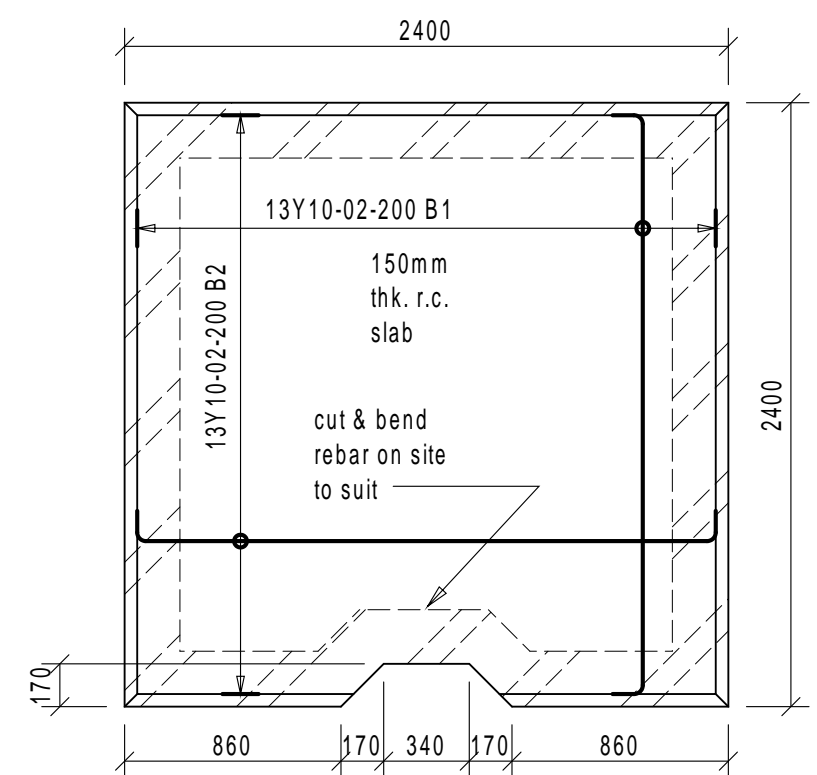
Notes :

1. See Architects layout for location of tank.
2. All foundation excavations to be compacted to a minimum of 93% Mod AASHTO prior to concrete being cast. Compaction test results are to be submitted to the engineer prior to casting of concrete.
3. Minimum 25MPa concrete strength at 28 days.
4. Minimum 14MPa NFX brickwork in class 2 mortar.



PLAN ON FOOTING

50mm cover to reinforcement all round



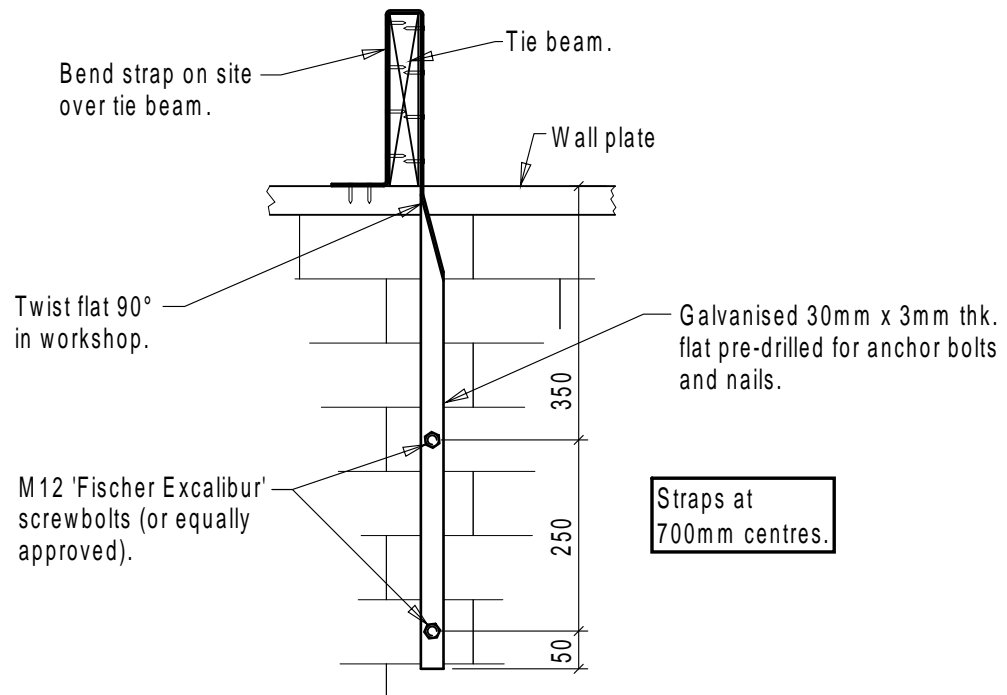
PLAN ON TANK SUPPORT SLAB

25mm cover to reinforcement all round

Polyurethane Water Storage Tank – 'strapping' down specifications

All water storage tanks are to be strapped down (at each of the 4 stubs on top of the tank) to the supporting concrete base with 2 no. off 4mm diameter fully galvanized stay wires (allow for 'turnbuckles' to tighten each of the 'double strap' stay wires). Each of the 'double strap' stay wires are to be tied to a M12 eye bolt of which is to be drilled and fixed to the 4 corners of the concrete supporting base. The specification for the eye bolt is as follows : galvanised mild steel - M12 eye bolt with 25mm eye inside diameter and with 80mm long shank.

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G	DETAILS	DRG. No.
								A		
	1	28 26	Y10 Y10	2750 2500	28 26	01 02	35 35	2550 2300	TYPICAL WATER SUPPORT TANK SUPPORT CONCRETE & REINFORCEMENT LAYOUT & DETAILS	Sk 313



- Remove plaster to accommodate strap anchor.
- Install anchor.
- Re-plaster over strap & anchor bolts.

SUGGESTED METHOD TO FIX NEW PRE-FABRICATED TIMBER ROOF TRUSSES TO EXISTING BRICKWORK

1. All damaged roof trusses to be replaced with pre-fabricated timber roof trusses to match existing.
2. All other damaged timber battens, wall plates, etc. to be removed and replaced with new timber to match existing.

General Plaster Repairs & Brickwork / Blockwork Stitching Repairs Specifications :

General Plaster 'Crack' Repairs :

1. Recommendations & Specifications :

All plaster 'cracking' must be repaired as specified below. The Contractor is also required to determine if any cracks in the plaster have been transferred to the blockwork / brickwork. (Contractor is required to cut 100mm long x 20mm wide inspection slot). If a crack has transferred to the blockwork / brickwork, then it needs to be repaired as set out in the specification for blockwork / brickwork 'stitching'.

1.1 Specification for General 'Plaster' Repair :

Break out and remove damaged plaster to 50mm into sound plaster. Clean wall and apply 'Sika Plasterstik' (or equally approved) bonding agent to manufacturer's specifications. Re-plaster wall and paint to Architects specifications.

1.2 Specification for Plaster Repair 'Cracking' :

Rake out crack 6mm deep x 6mm wide. Clean out all debris / loose material. Fill with acrylic filler - 'Sikacryl' (or equally approved) to manufacturers specifications. Paint to Architects specifications.

Specification for Blockwork / Brickwork 'Stitching' Repair :

- " Rake out crack. Remove all debris / loose material.
- " Stitch crack in blockwork / brickwork with R8 reinforcing rods.
- " R8 reinforcing rods are to be 300mm long with 50mm bends at both ends - total length = 400mm.
- " R8 reinforcing rods are to be epoxy grouted with 'Prostruct 617' general purpose epoxy adhesive (or equally approved) at 250mm centres, and grouted into (10mm deep) slots cut into blockwork / brickwork and with (60mm deep) 10mm Ø drill holes at each end to accommodate the bends of the reinforcing rods.
- " All slots and drill holes to be completely filled with epoxy adhesive.
- " All slots to be cut perpendicular to the crack in the blockwork / brickwork.
- " Epoxy adhesive application to be as per manufacturers' specifications.
- " Apply 'Sika Plasterstik' (or equally approved) and re-plaster wall, however if large areas of plaster has been removed, 450mm wide 'chicken wire mesh' must be 'tacked on' over the cracked area prior to re-plastering.
- " Re-paint plaster to Architects specifications.

CONCRETE SPALLING REPAIRS FOR REPAIRS UP TO 30mm THICK :

Surface Preparation :

- " Remove all loose, unsound concrete from the areas to be repaired.
- " Cut out around the areas to be repaired to a minimum depth of 10mm to avoid feather edging.
- " High pressure water blast the prepared areas to remove any contaminants.
- " Ensure that the substrate onto which the repair mortar is to be applied is sound and free from loose material.
- " If reinforcing is exposed & shows signs of corrosion, the reinforcing shall be opened up by breaking out the concrete to a depth of 20mm below the reinforcing and 50mm beyond the corroded length of the reinforcing.
- " Any exposed steel must be mechanically cleaned and coated with 1 coat of 'Prostruct 688' Zinc Rich Primer (or equally approved) @ 4m²/lt.
- " Removal of badly corroded reinforcement and its replacement - All to engineers instructions on site.

Priming :

- " Pre-dampen prepared surface with water.
- " Do not allow to dry out prior to the application of the 'Prostruct 528' Structural Concrete (or equally approved) .

Repair Mortar :

- " Apply 'Prostruct 528' Structural Concrete (or equally approved) into the pre-saturated surface.
- " Coverage will be approximately 1.4m² @ 10mm thick per 25kg bag of repair mortar.
- " Ensure complete substrate contact and maximum compaction.
- " Cure the repairs by keeping them damp for 24 hours after the initial set has taken place.

CONCRETE SPALLING REPAIRS FOR REPAIRS OVER 30mm THICK :

Surface Preparation :

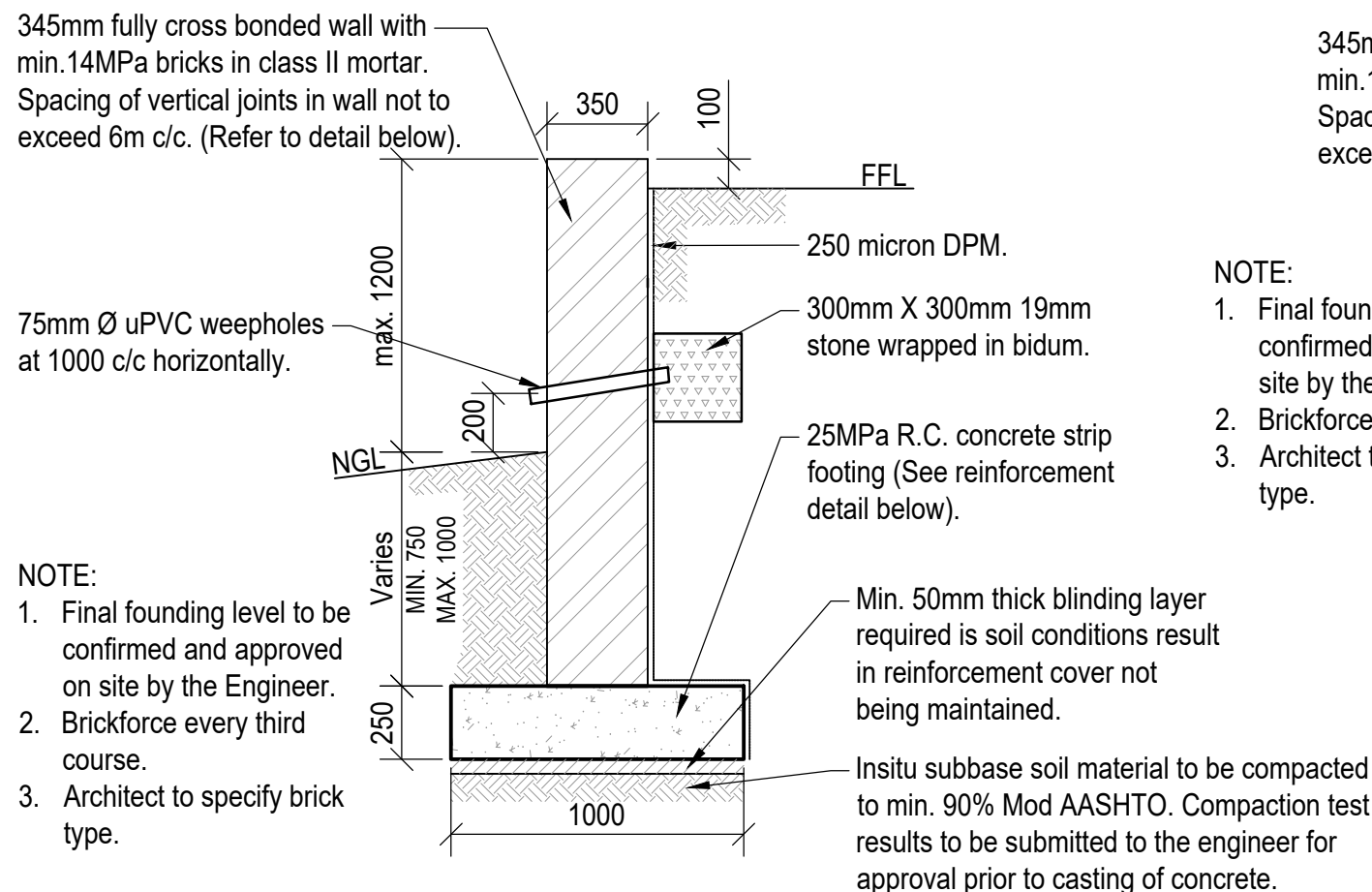
- " Remove all loose, unsound concrete from the areas to be repaired.
- " Cut out around the areas to be repaired to a minimum depth of 10mm to avoid feather edging.
- " High pressure water blast the prepared areas to remove any contaminants.
- " Ensure that the substrate onto which the repair mortar is to be applied is sound and free from loose material.
- " If reinforcing is exposed & shows signs of corrosion, the reinforcing shall be opened up by breaking out the concrete to a depth of 20mm below the reinforcing and 50mm beyond the corroded length of the reinforcing.
- " Any exposed steel must be mechanically cleaned and coated with 1 coat of 'Prostruct 688' Zinc Rich Primer (or equally approved) @ 4m²/lt.
- " Removal of badly corroded reinforcement and its replacement - All to Engineers instructions on site.

Priming :

- " Pre-dampen prepared surface with water as described below.

Repair Material:

- " Shutter up sides and / or soffit of area to be repaired.
- " Thoroughly wet the surface of the concrete within the repair area with water.
- " Drain excess water.
- " Mix 'Prostruct 531-MCI' Five Star Grout (or equally approved) as per detailed instructions and pour repair grout into the shuttered area from one side, ensuring that the grout fills the entire shuttered area with no air pockets.
- " Coverage will be approximately 1,4m² @ 10mm thick per 25kg bag of repair grout.
- " Leave shutter in position for at least 24hrs and then strip and clean down the newly repaired surface.
- " Repaired areas must be wet cured for a minimum of 3 days once shutters have been stripped.

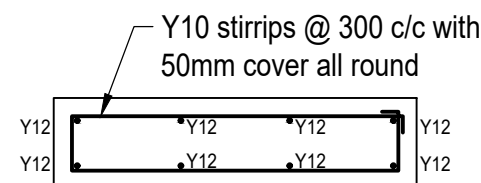


TYPE A

TYPICAL 345mm CROSS BONDED BRICK RETAINING WALL WITH WEEP HOLES

N.T.S

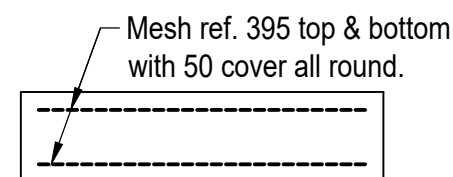
OPTION 1 OR OPTION 2 TO BE CONFIRMED BY ENGINEER ON SITE



OPTION 1

WALL FOUNDATION REINFORCEMENT DETAILS

N.T.S

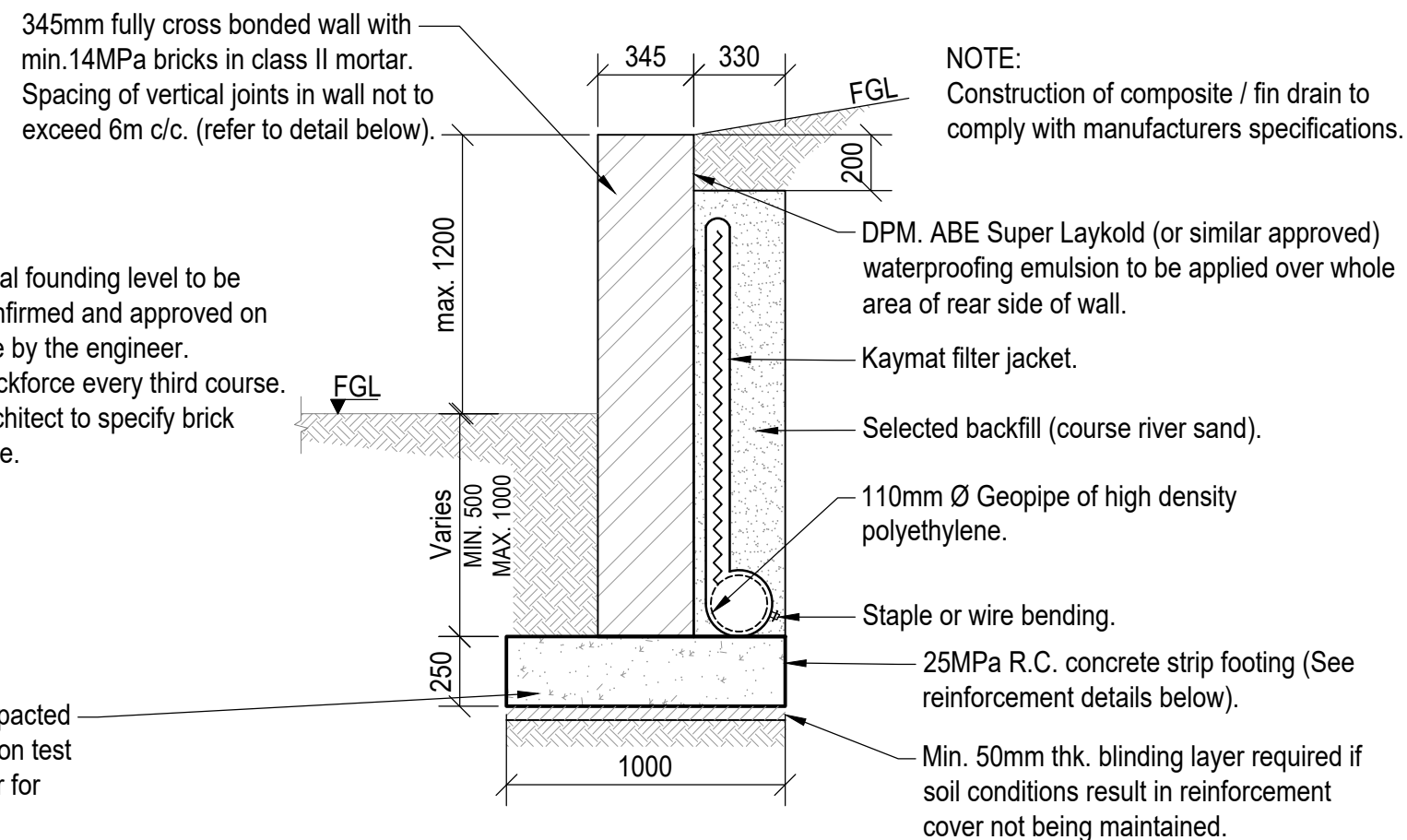


OPTION 2

WALL FOUNDATION REINFORCEMENT DETAILS

N.T.S

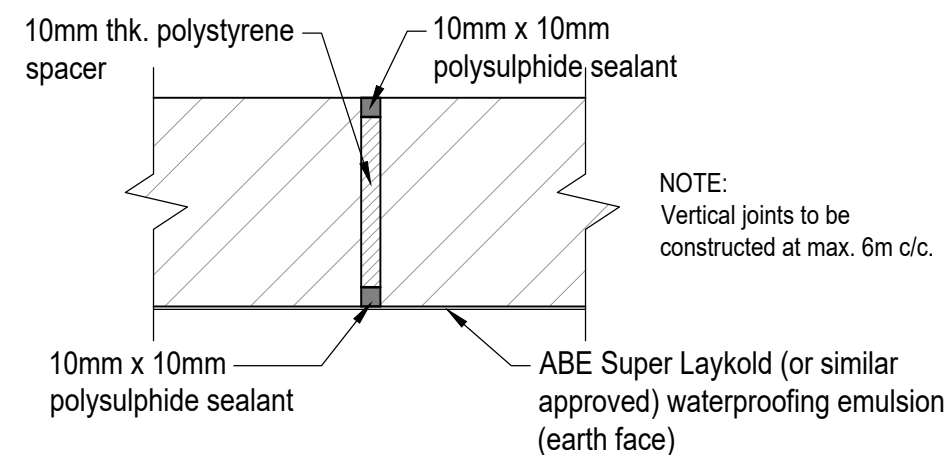
- NOTE:
1. Final founding level to be confirmed and approved on site by the engineer.
 2. Brickforce every third course.
 3. Architect to specify brick type.



TYPE B

TYPICAL 345mm CROSS BONDED BRICK RETAINING WALL WITH COMPOSITE/FIN DRAIN DETAILS

N.T.S



TYPICAL VERTICAL ISOLATION JOINT DETAIL

N.T.S



DETAILS:

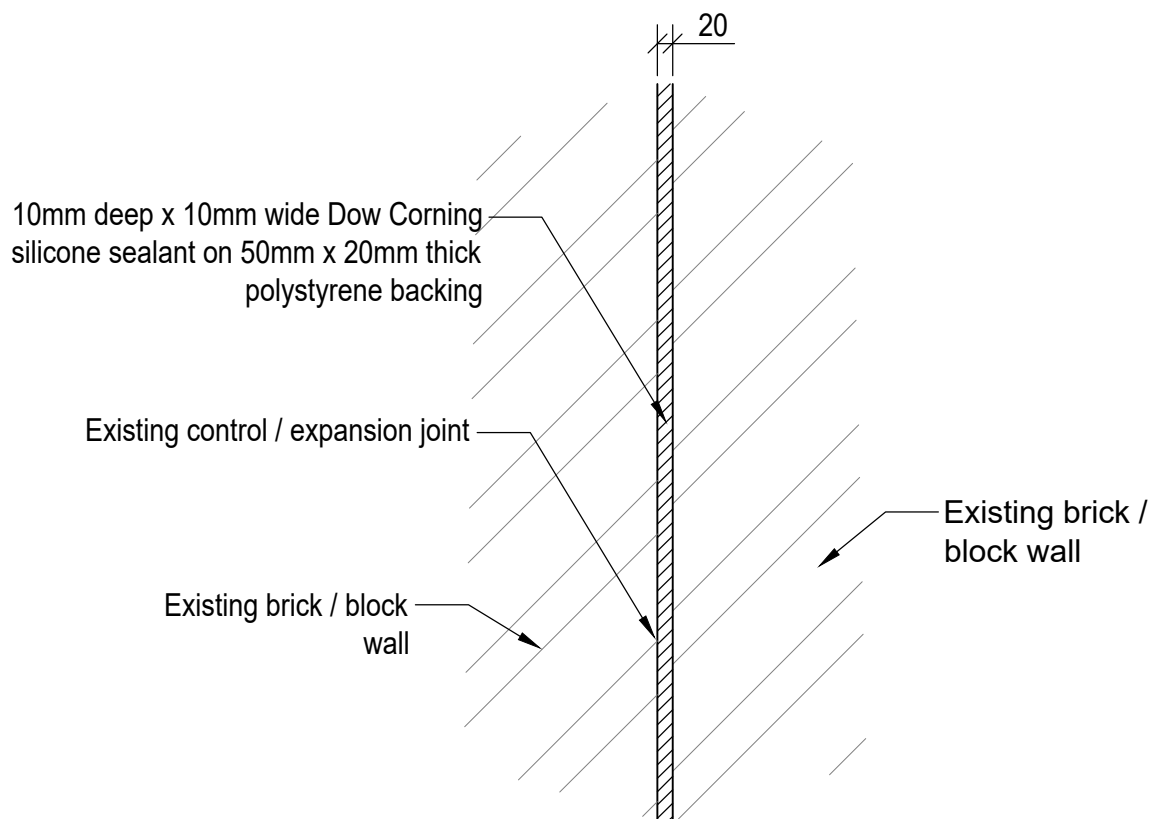
TYPICAL 345mm FULLY CROSS BONDED BRICK RETAINING WALL DETAILS

SKETCH No.

Sk 318

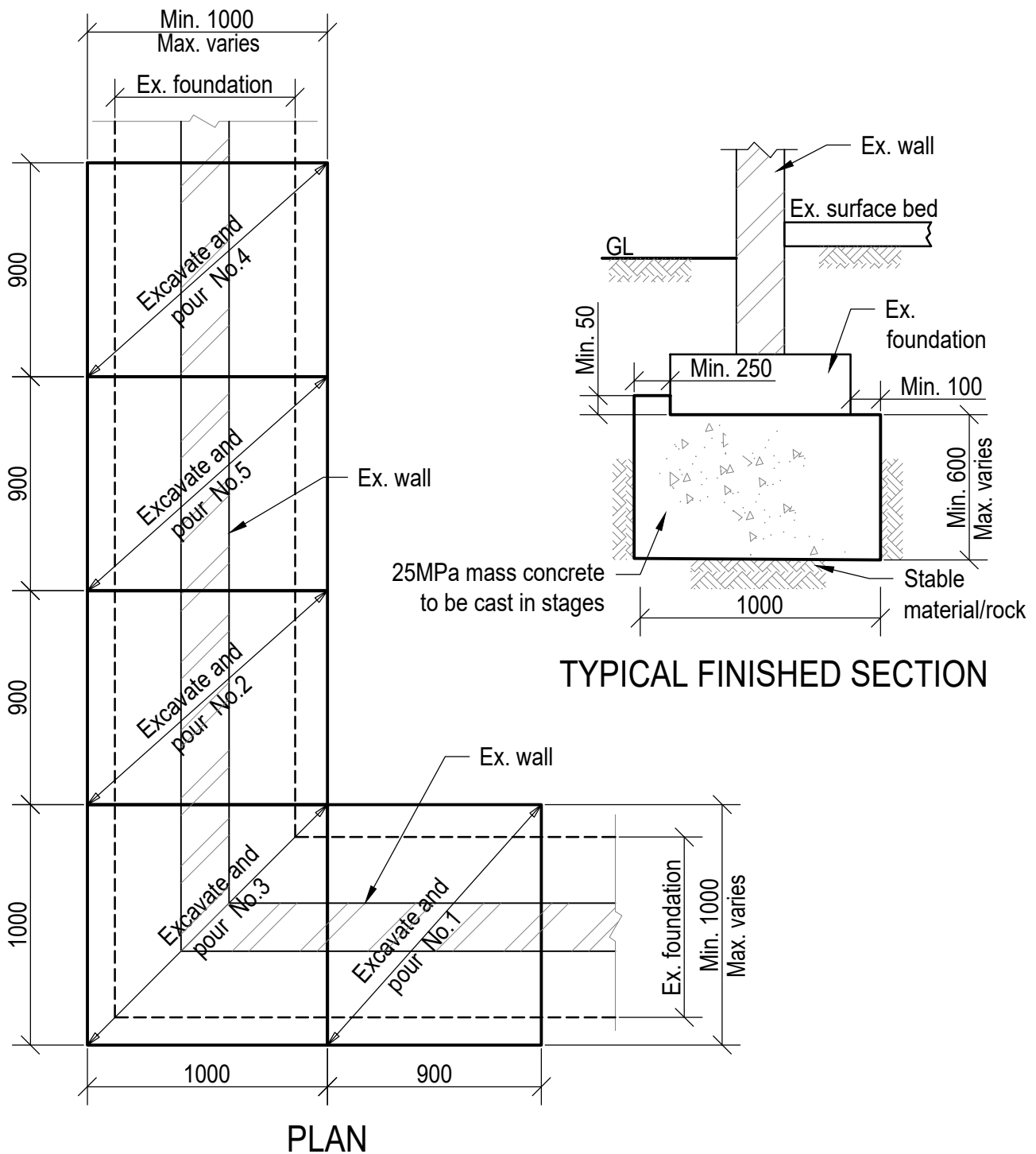
NOTES:

1. Scrape out and remove existing mortar filler at control / expansion joint to a minimum depth of 60mm.
2. Insert 50mm x 20mm thick polystyrene backing along length of joint.
3. Apply 10mm deep x 20mm wide Dow Corning silicone sealant to cover joint and make good.



TYPICAL REPAIR DETAILS TO EXISTING CONTROL / EXPANSION JOINTS

N.T.S



NOTES:

1. Highly workable mass concrete class 25/19.
2. Minimum 24 hours between each excavation and pour operation.
3. New founding depth and width to be determined on site by Engineer.
4. Extent of underpinning to be determined on site by Engineer.

REPAIRS TO EXISTING CONCRETE SURFACE BED:

Surface Preparation :

- " Remove all loose, unsound concrete from the areas to be repaired.
- " Cut out around the areas to be repaired to a minimum depth of 10mm to avoid feather edging.
- " High pressure water blast the prepared areas to remove any contaminants.
- " Ensure that the substrate onto which the repaired concrete is to be applied is sound and free from loose material.
- " If reinforcing is exposed & shows signs of corrosion, the reinforcing shall be opened up by breaking out the concrete to a depth of 20mm below the reinforcing and 50mm beyond the corroded length of the reinforcing.
- " Any exposed steel must be mechanically cleaned and coated with 1 coat of 'Prostruct 688' Zinc Rich Primer (or equally approved) @ 4m²/lt.
- " Removal of badly corroded reinforcement and its replacement - All to engineers instructions on site.

Tolerances :

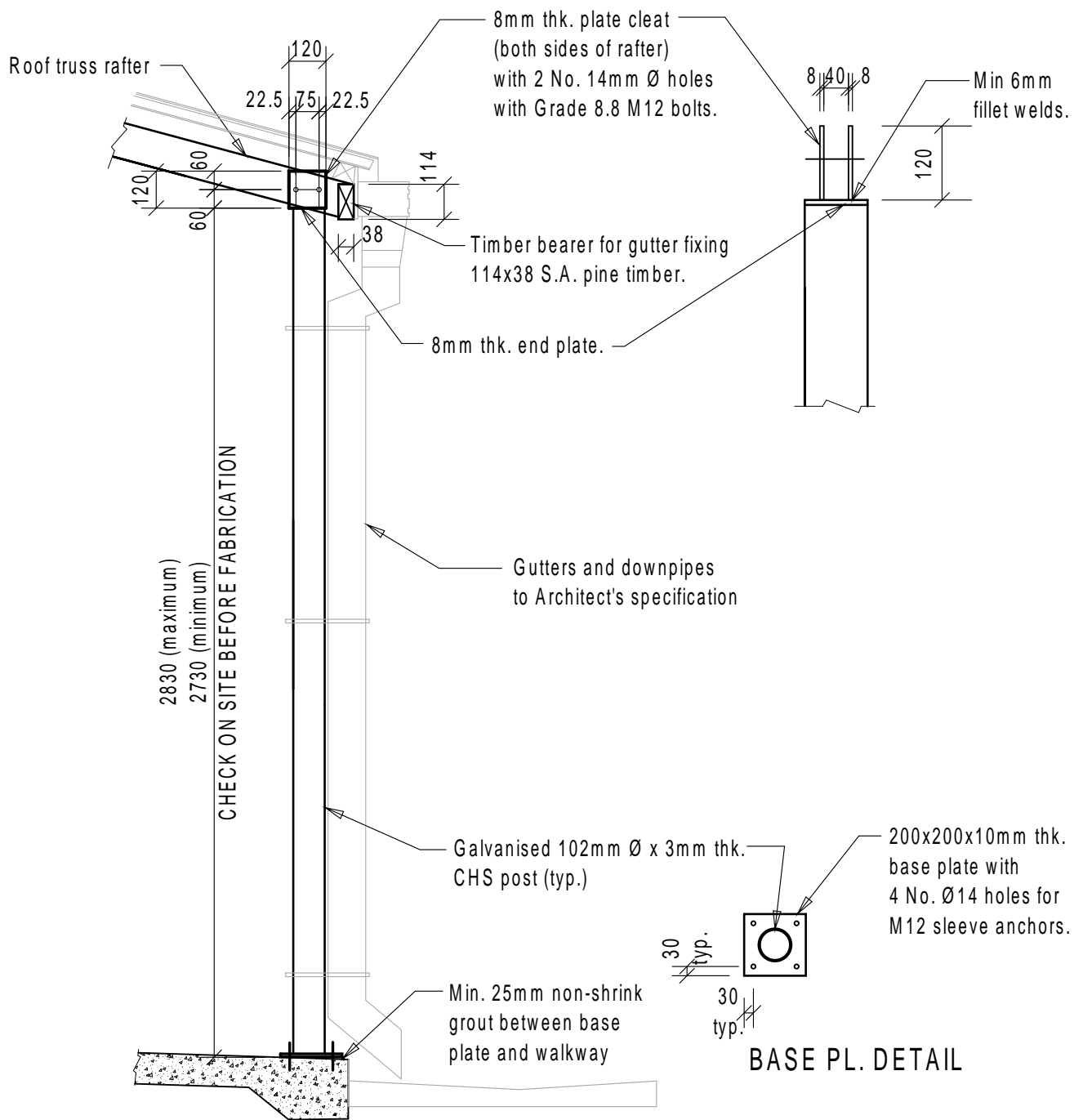
- " If loose material exceeds more than 20mm thick, the entire concrete slab is to be demolished and re-cast as per Sketch No. : Sk 304.

Priming :

- " Pre-dampen prepared surface with water as described below.

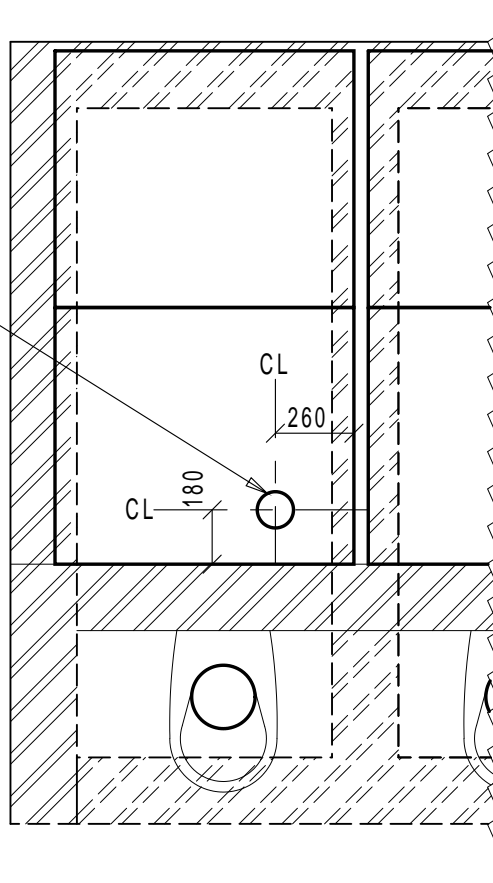
Repair Material:

- " Thoroughly wet the surface of the concrete within the repair area with water.
- " Drain excess water.
- " Mix 'Prostruct 617' Wet to Dry Epoxy Grout (or equally approved) as per detailed instructions and re screed the surface bed.
- " Repaired areas must be wet cured for a minimum of 3 days once shutters have been stripped.

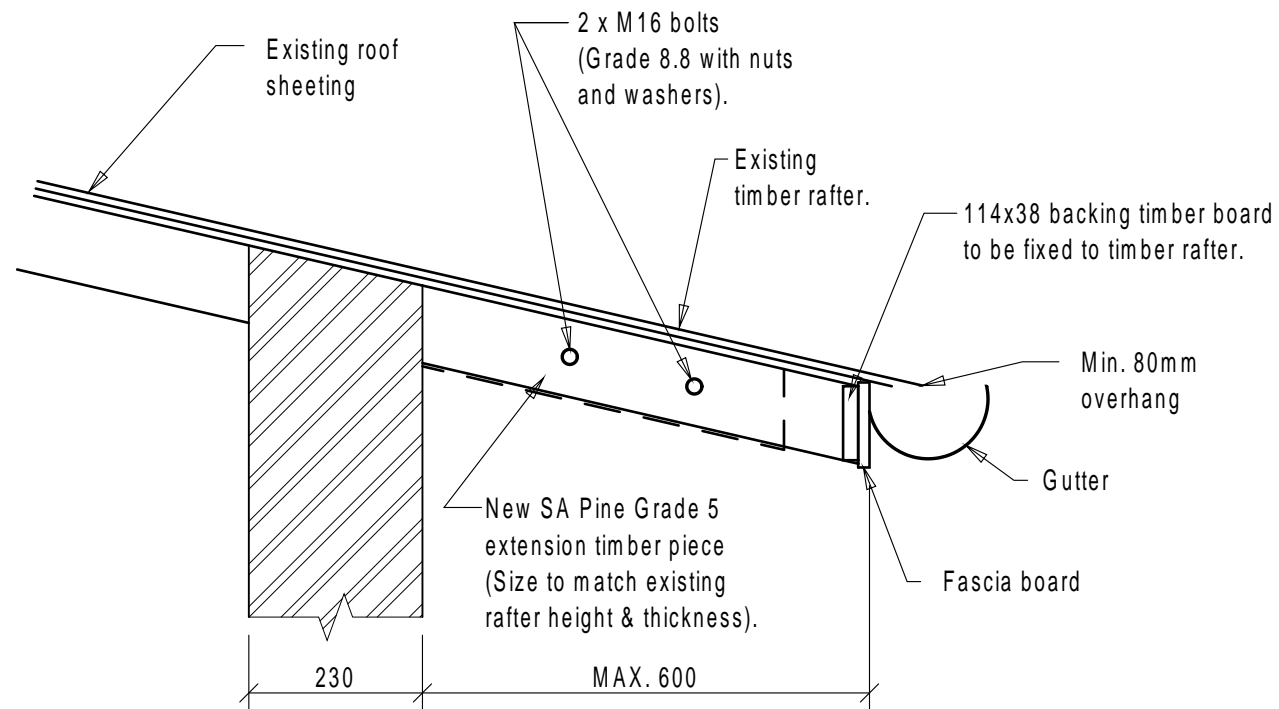


STEEL POST DETAIL

120mm Ø penetration
for 110mm Ø vent pipe.

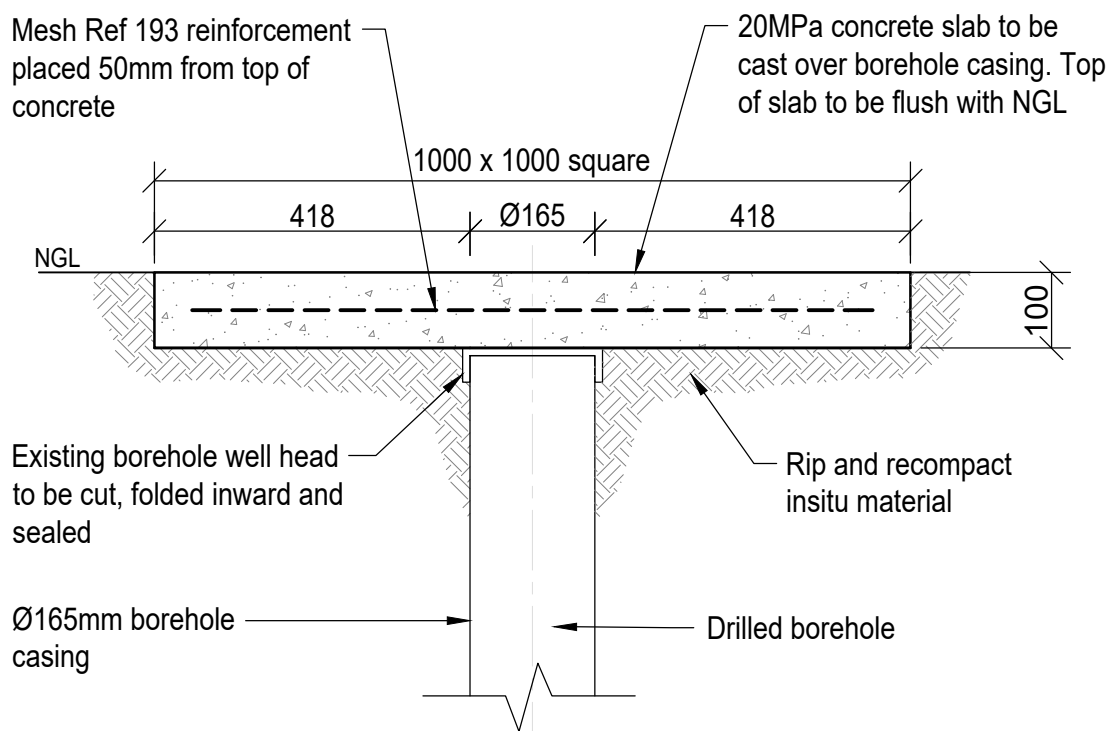


VENT PIPE SETTING OUT ON PRECAST PANEL FOR ABLUTION PITS



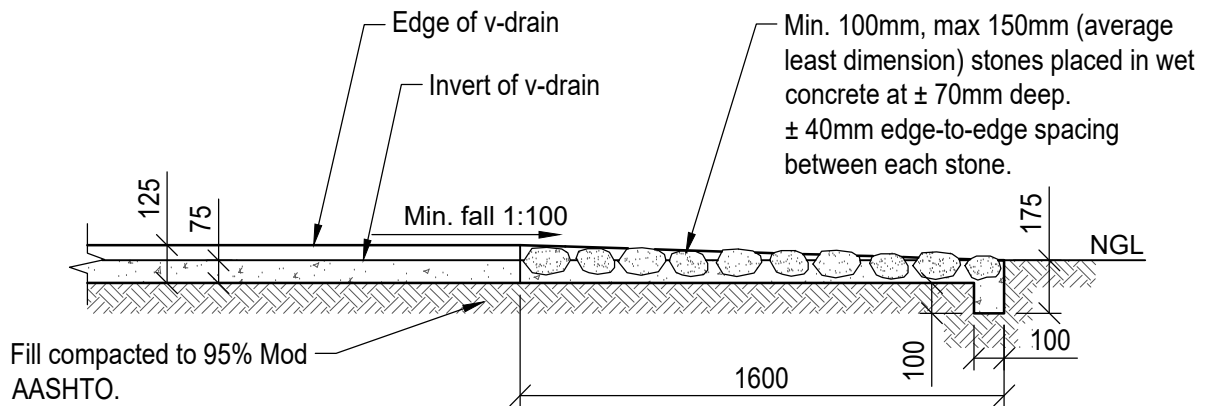
SPECIFICATION ON EXTENSION FOR TIMBER RAFTER

SCALE 1:10



SECTION THROUGH A TYPICAL BOREHOLE CAPPING DETAIL

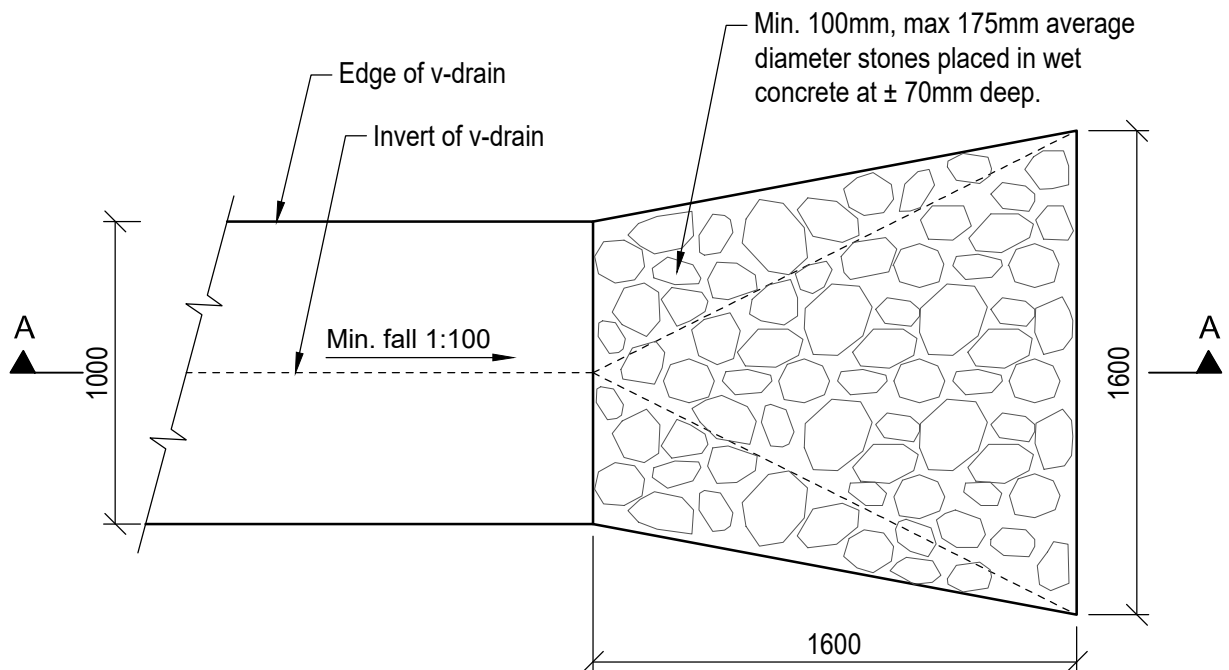
SCALE 1:10



SECTION A-A

N.T.S

V-drains to be constructed with 1:100 minimum fall

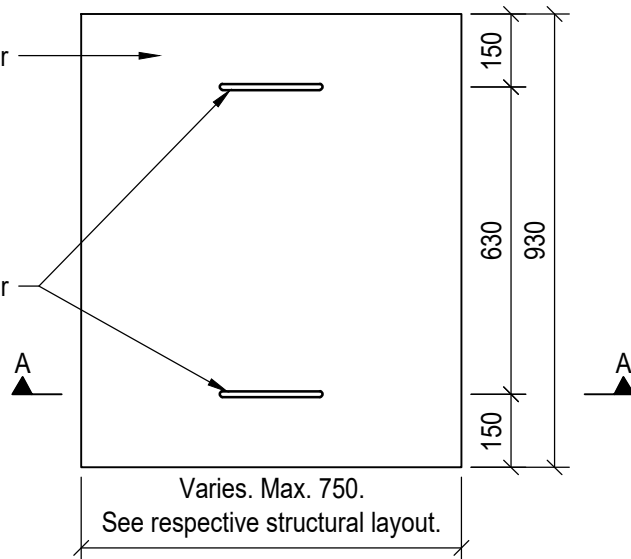


PLAN STONE PITCHED SPREADER

N.T.S

New 30MPa pre-cast concrete pit cover slab. dimensions as per the respective structural drawings and layouts.
Reinforced with Mesh Ref. 395.

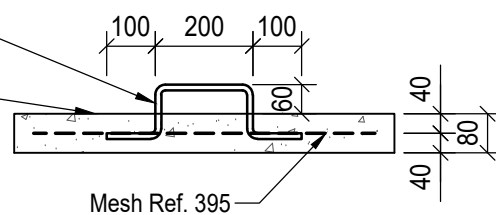
Galvanised Y12 rebar



PLAN
SCALE 1:15

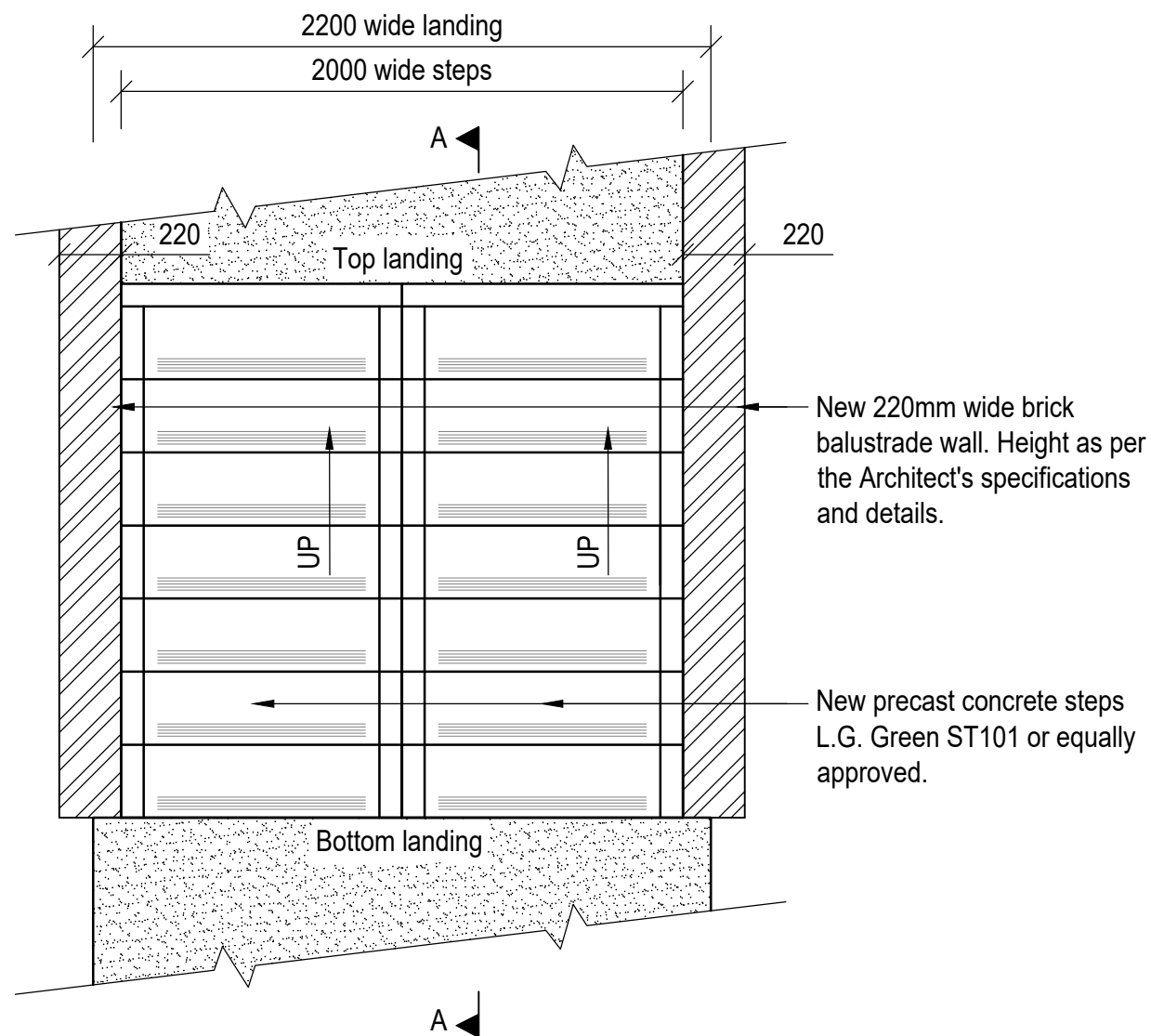
New 30MPa pre-cast concrete pit cover slab. dimensions as per the respective structural drawings and layouts.
Reinforced with Mesh Ref. 395.

Galvanised Y12 rebar



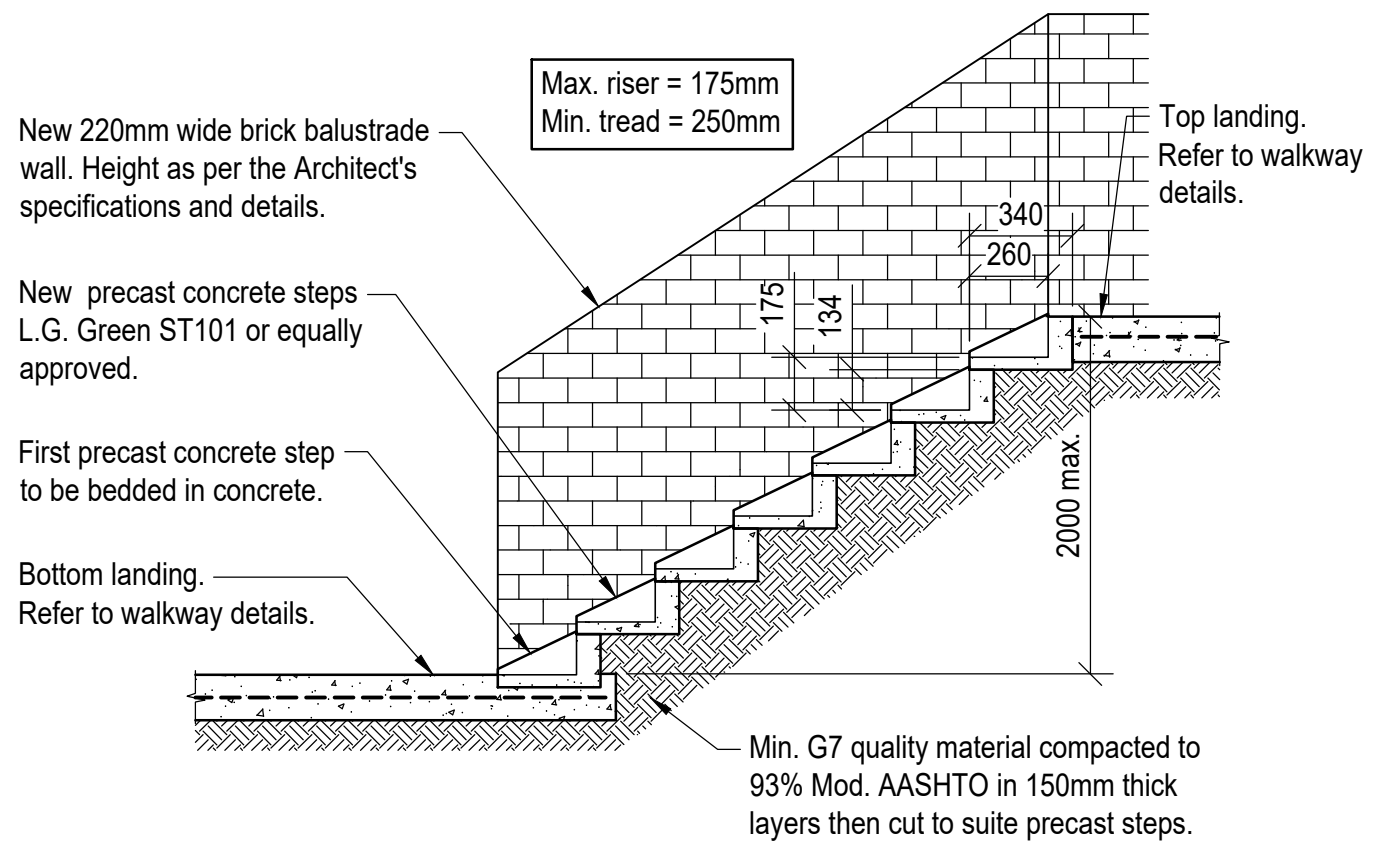
SECTION A-A
SCALE 1:15

NOTE: New L.G. Green pre-cast concrete steps to be installed as per the manufacturers specifications



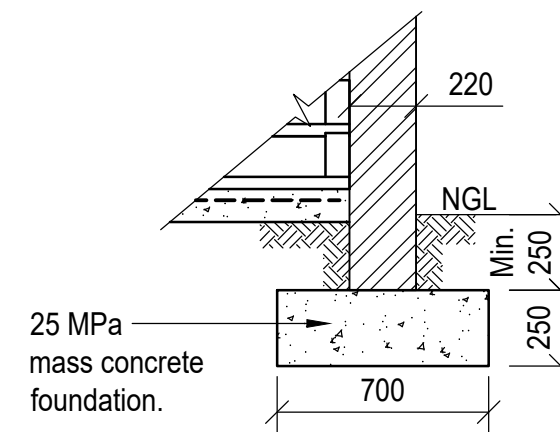
PLAN

SCALE 1:25



SECTION A-A

SCALE 1:25



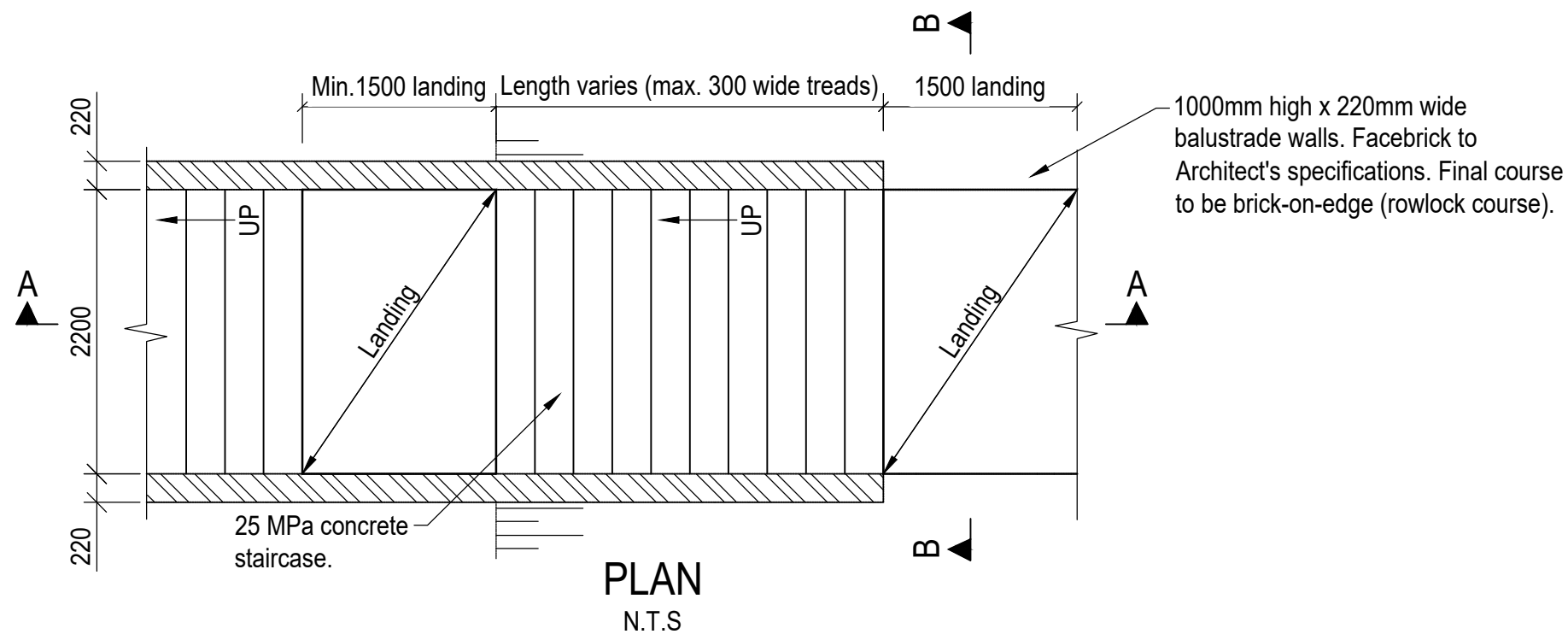
MASS CONCRETE FOUNDATION DETAIL

SCALE 1:25



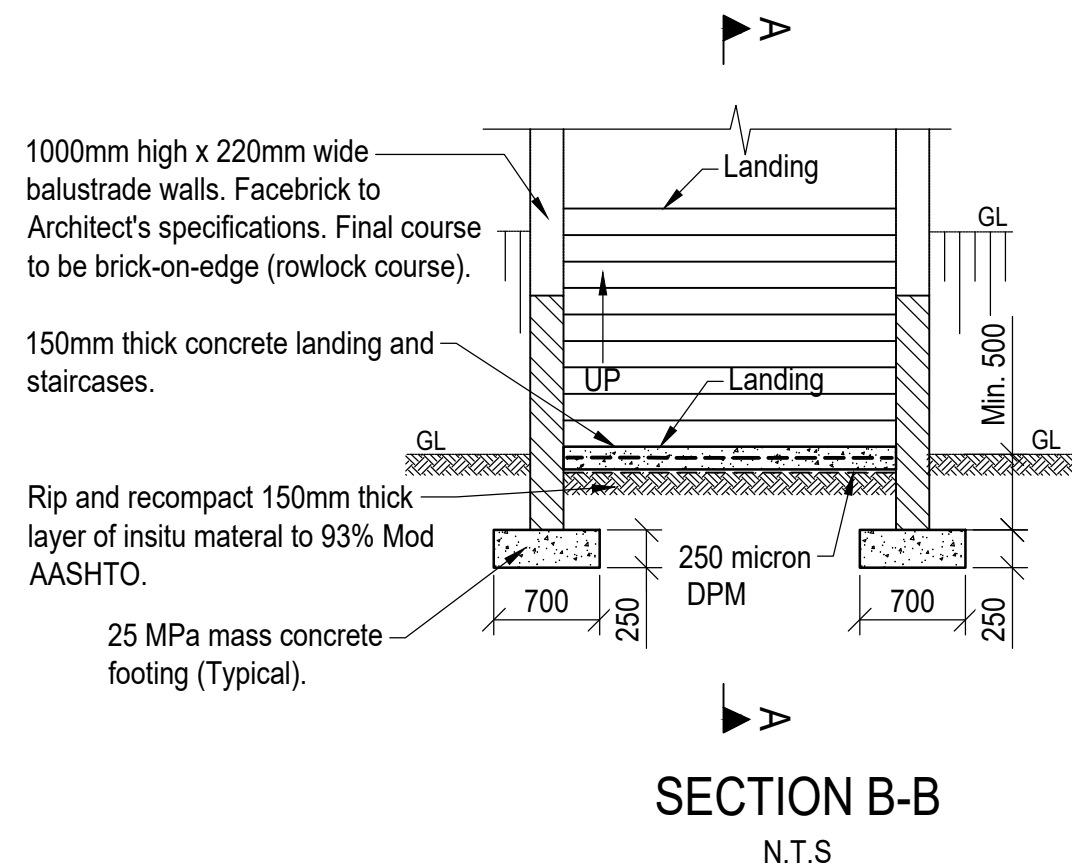
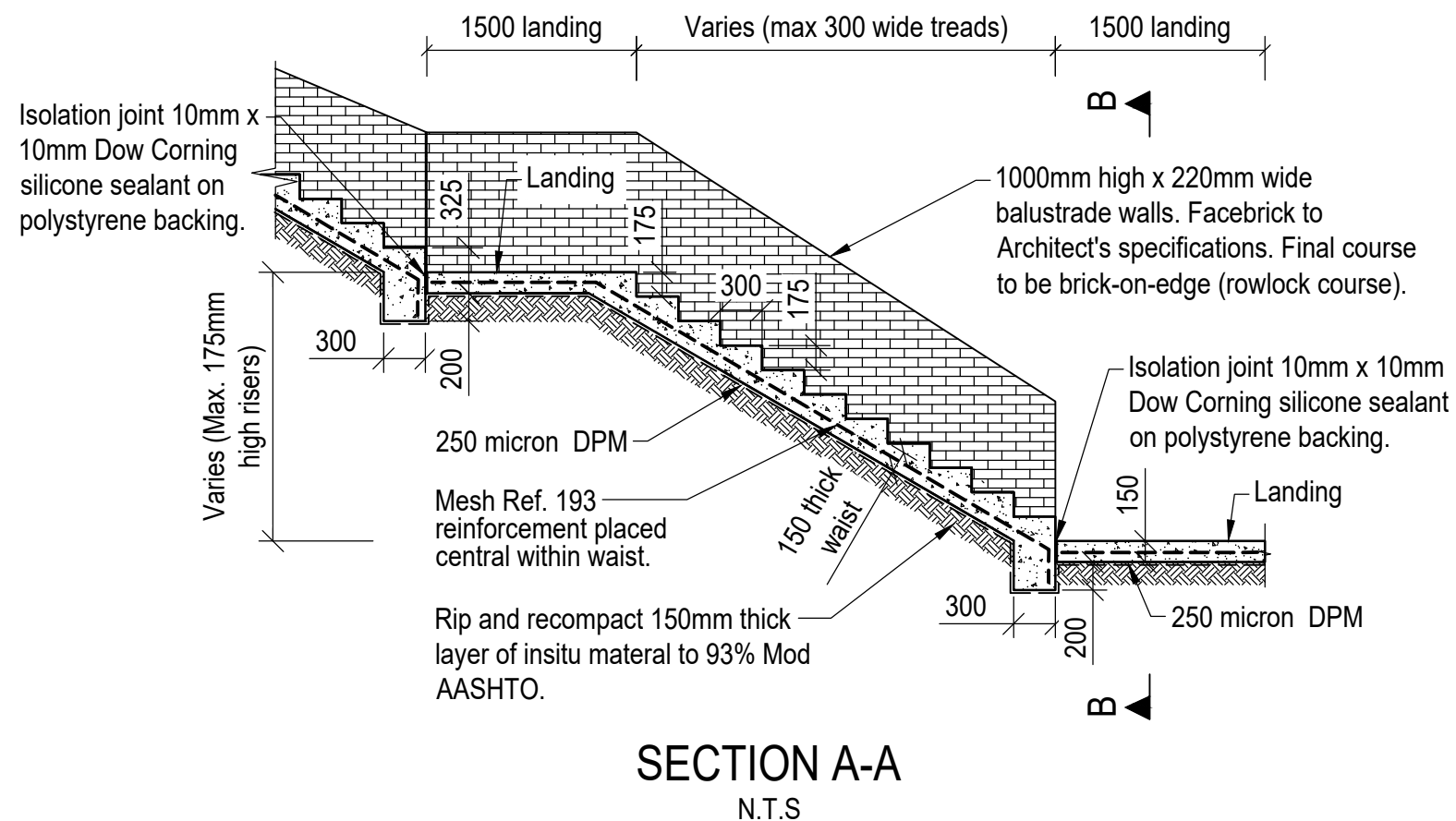
DETAILS:
TYPICAL PRE-CAST
CONCRETE STAIRCASE
DETAILS

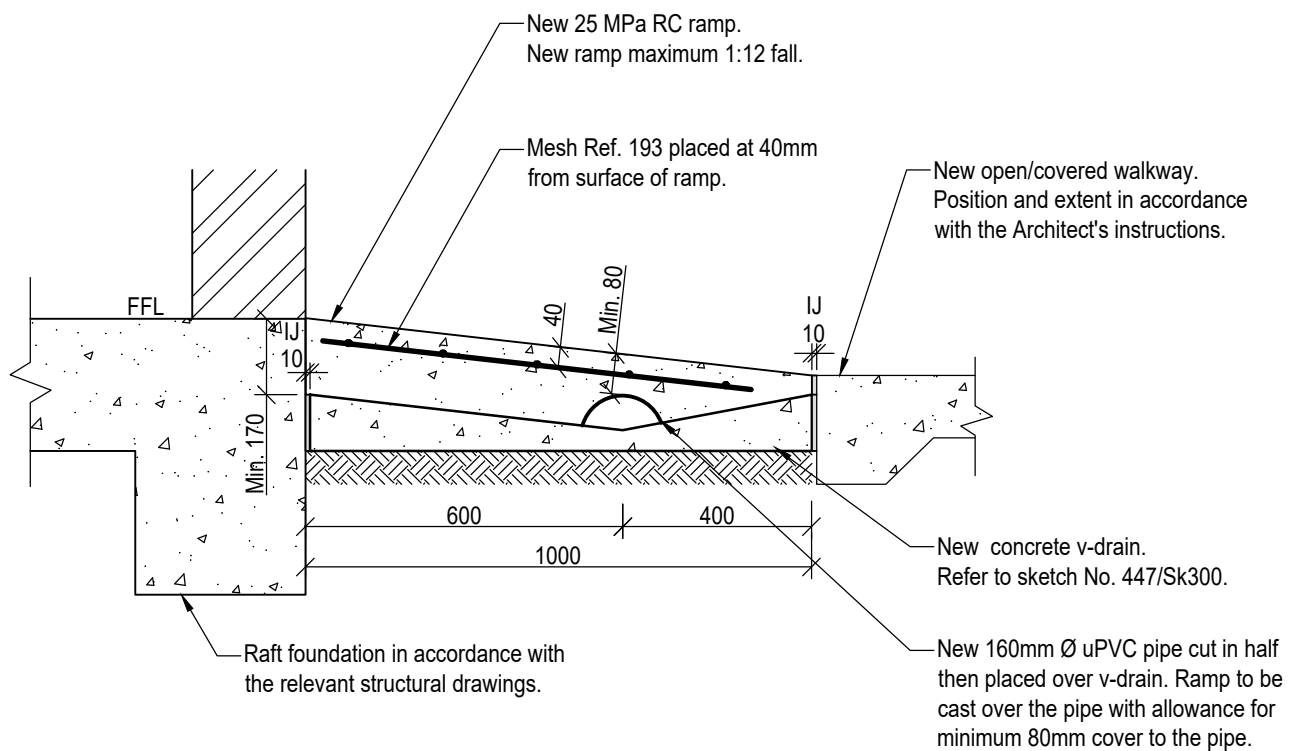
SKETCH No.
SK330



NOTES:

1. Refer to architectural drawings for positions of new staircases.
2. Face brick to be in accordance with the Architect's specifications.
3. Rip and recompact 150mm thick layer of insitu material to 93% Mod AASHTO.

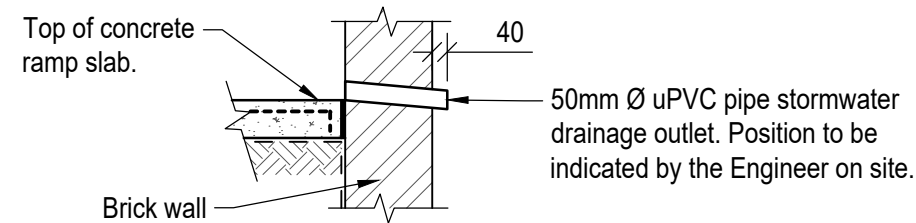




SECTION

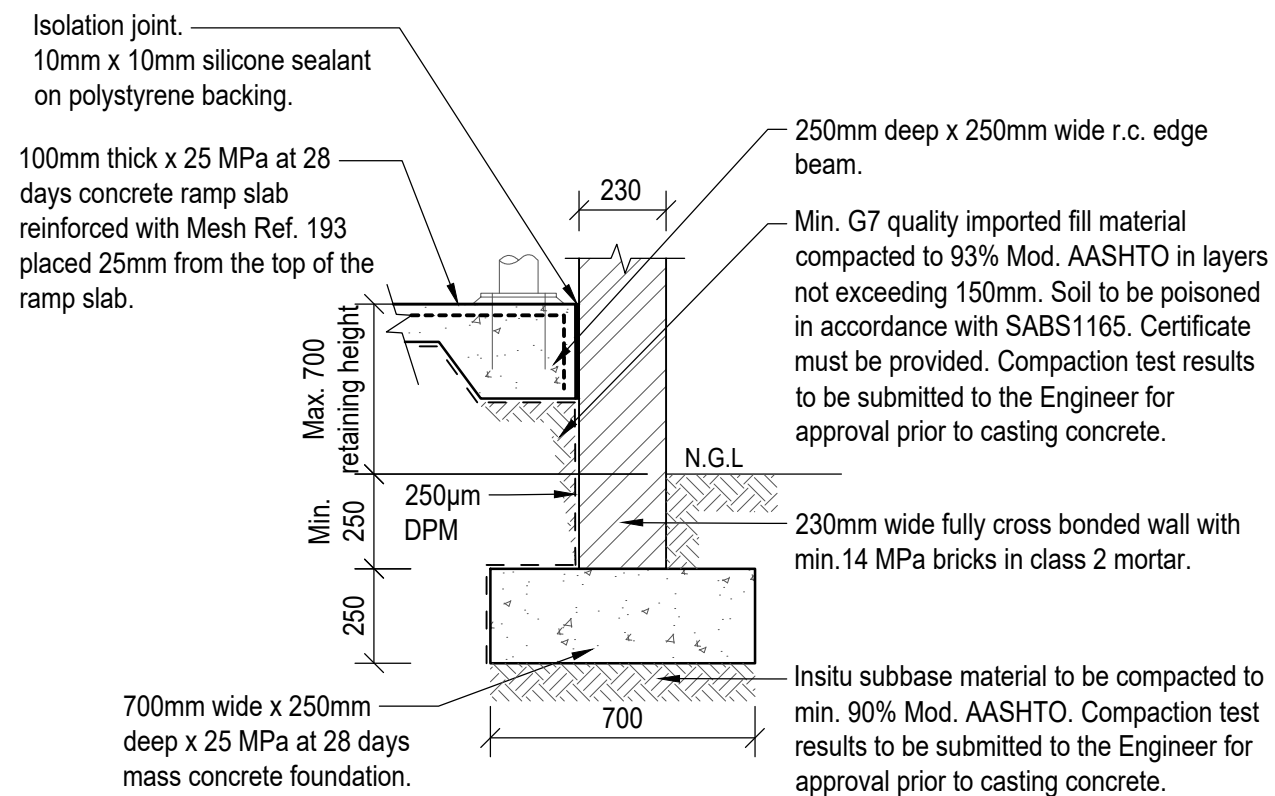
TYPICAL RAMP / V-DRAIN CROSSING DETAIL

N.T.S



CROSS SECTION SHOWING A TYPICAL STORMWATER DRAINAGE OUTLET POSITION

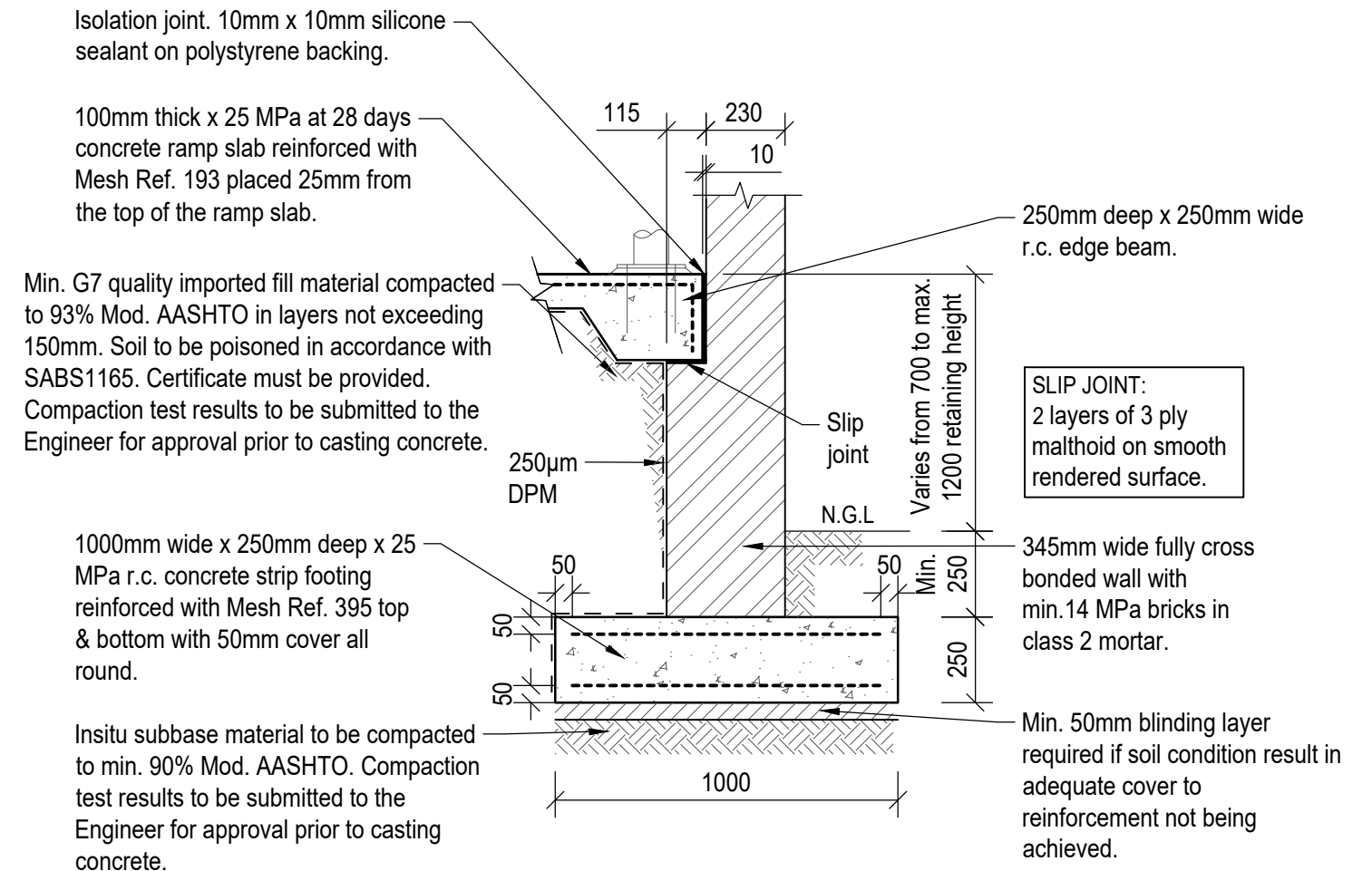
N.T.S



230mm WIDE RETAINING WALL DETAIL FOR RAMPS: UP TO MAXIMUM 700mm HIGH RETAINING HEIGHT

N.T.S

- NOTE:**
1. Final founding level to be confirmed and approved on site by the Engineer.
 2. Steel reinforcement to be inspected and approved by the Engineer prior to casting concrete.
 3. Brickforce every third course.
 4. Architect to specify brick type.
 5. Architect to specify balustrade wall height.

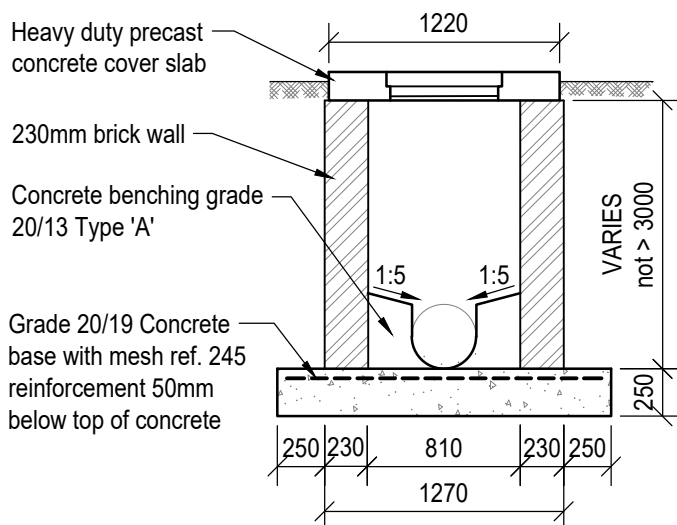
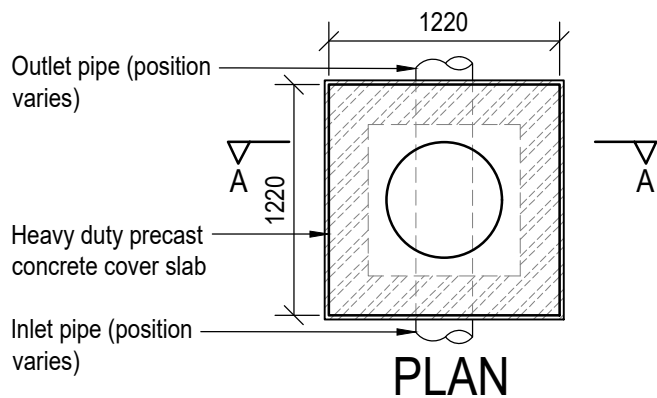


345mm WIDE RETAINING WALL DETAIL FOR RAMPS: 700mm TO MAXIMUM 1200mm HIGH RETAINING HEIGHT

N.T.S



SECTION 3 CIVIL TYPICAL DETAILS AND SPECIFICATIONS



SECTION A - A

TYPICAL MANHOLE DETAILS FOR DEPTHS NOT EXCEEDING 3000mm AND FOR PIPES SIZES NOT > 675mm Ø

SCALE 1:40

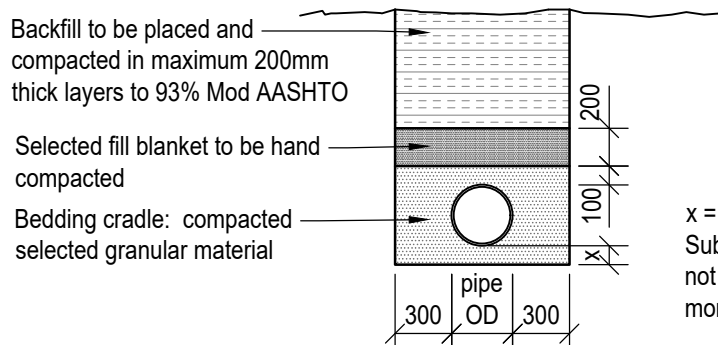
NOTES

GENERAL

1. Setting out to Engineers details.
2. Prove all services prior to construction.
3. All work areas to be reinstated (premix, concrete, etc.)
4. Supply and installation to comply with SANS 1200.
5. All levels and dimensions to be verified on site.
6. This drawing is to be read in conjunction with the Architectural and Mechanical Engineer's drawings.

STORMWATER

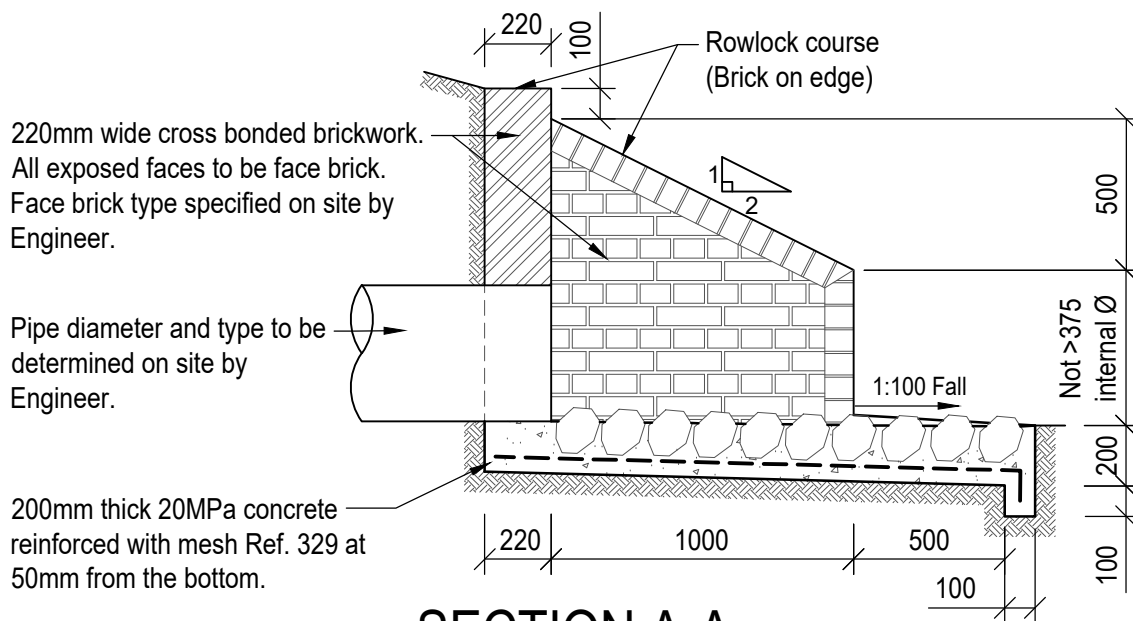
1. insitu ground must be compacted to 95% Mod. A.A.S.H.T.O. prior to the inlet base slab being cast. If this density cannot be attained the insitu material must be removed to a depth of 300mm and replaced with a selected backfill.
2. Bricks to be engineering units (NXFE-14) as per SABS 227.
3. Type and class of pipe as specified on site.
4. Manhole cover and frame to be confirmed on site.



$x = D/4$
Subject to (x) being not less than 100mm and not more than 200mm

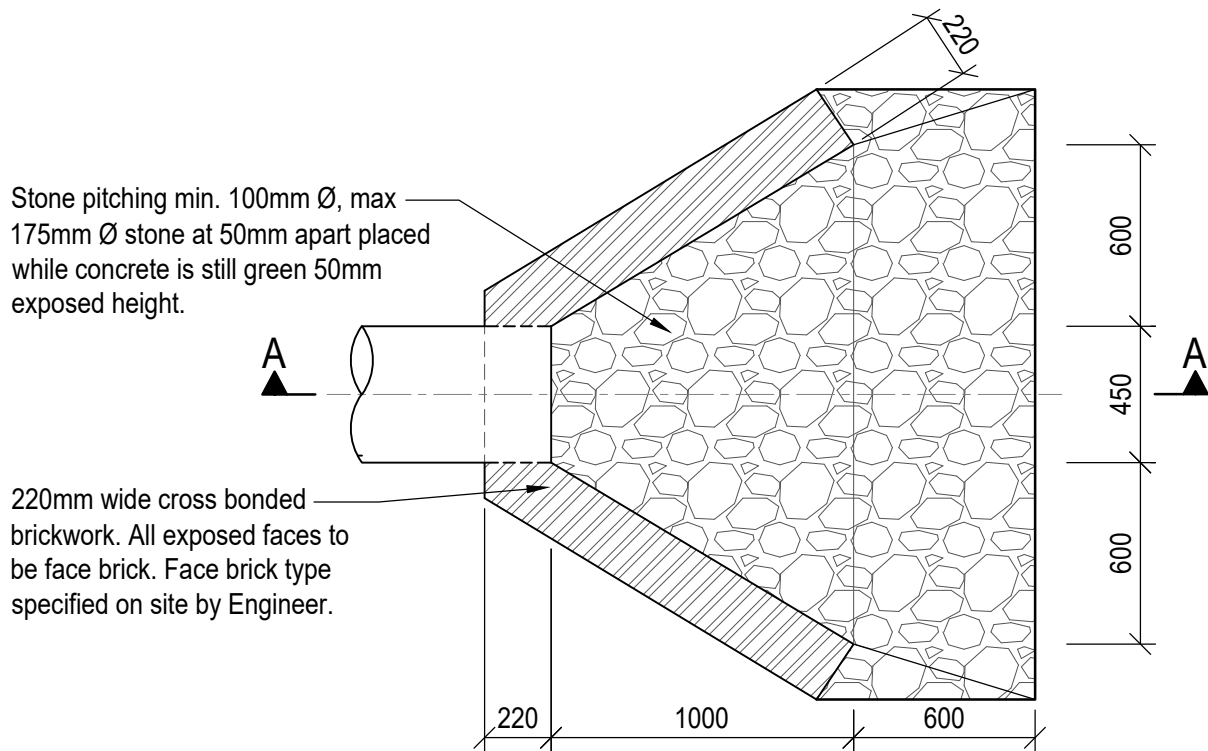
PIPE BEDDING DETAIL: FLEXIBLE PIPES

SCALE 1:40



SECTION A-A

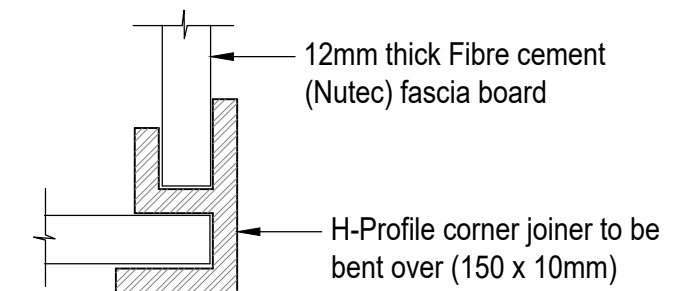
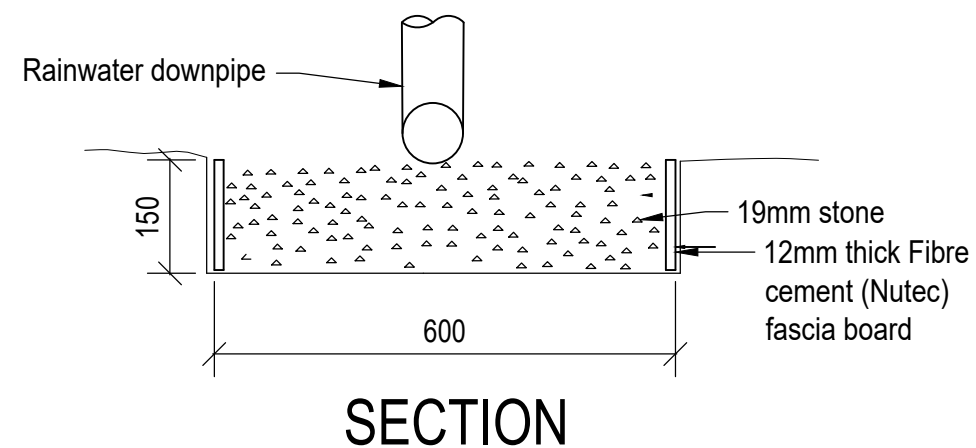
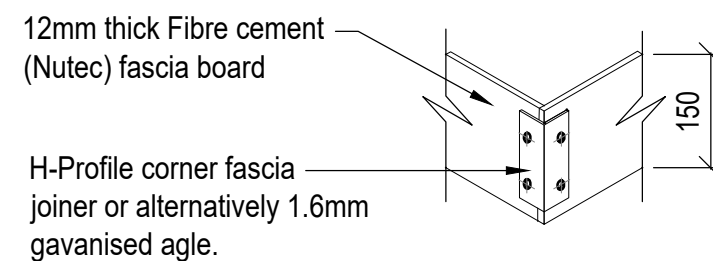
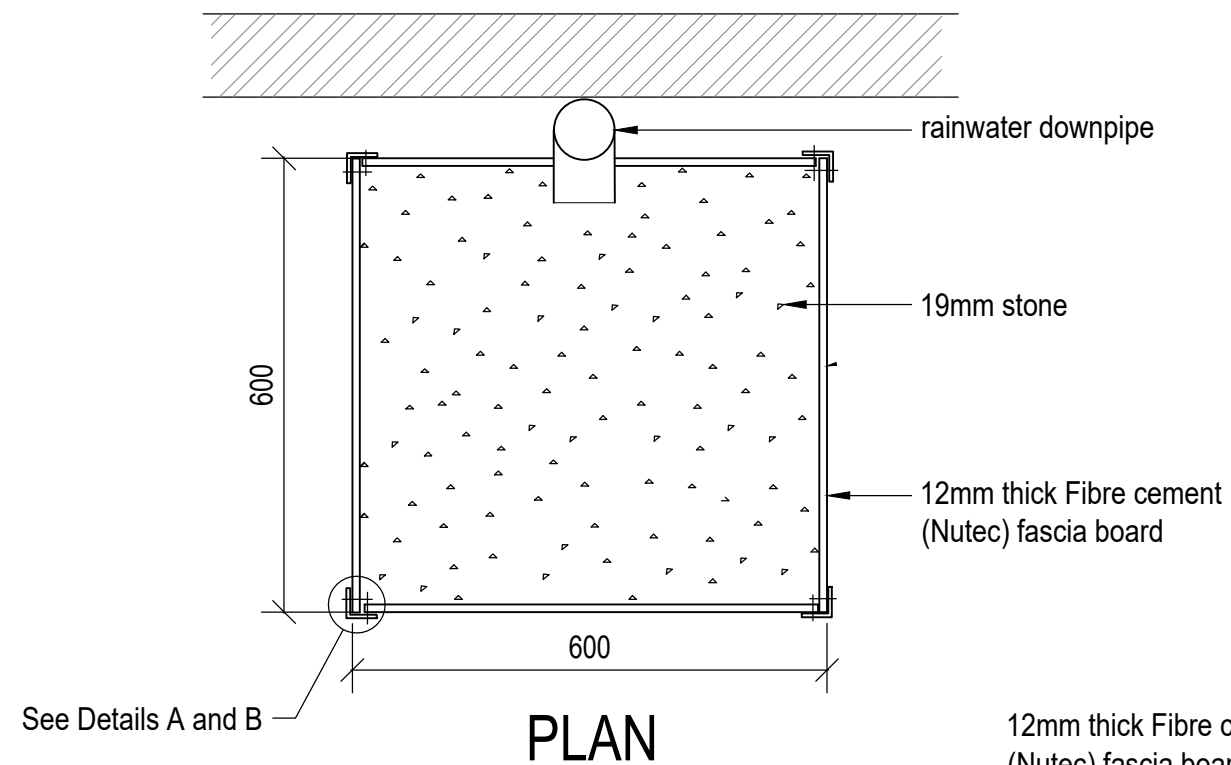
SCALE 1:25



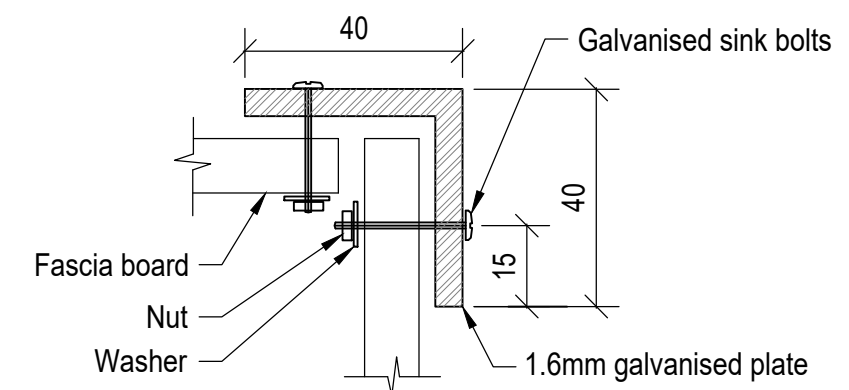
PLAN

SCALE 1:25

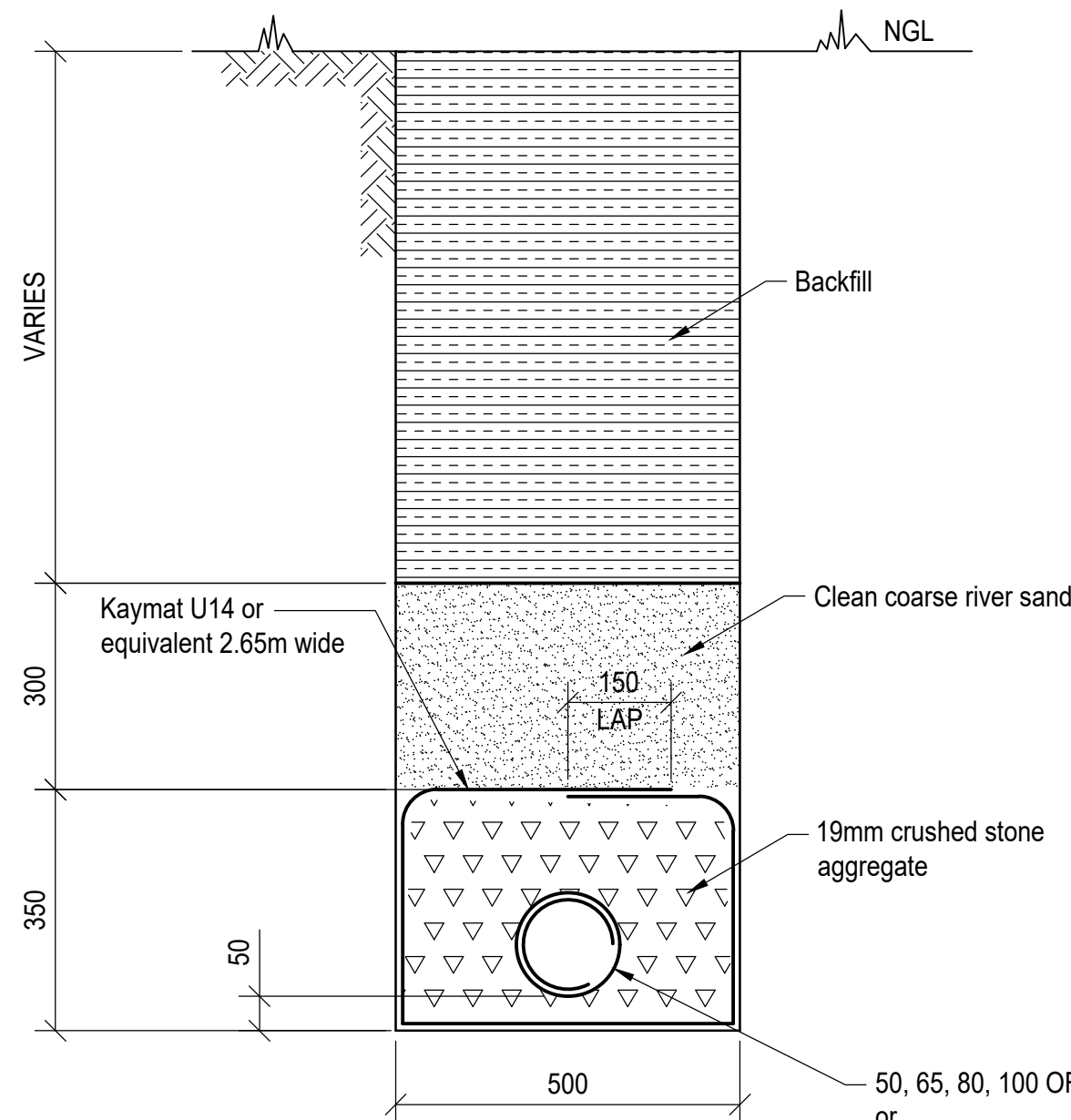
STORMWATER HEADWALL DETAILS



DETAIL A
H - PROFILE CORNER JOINT

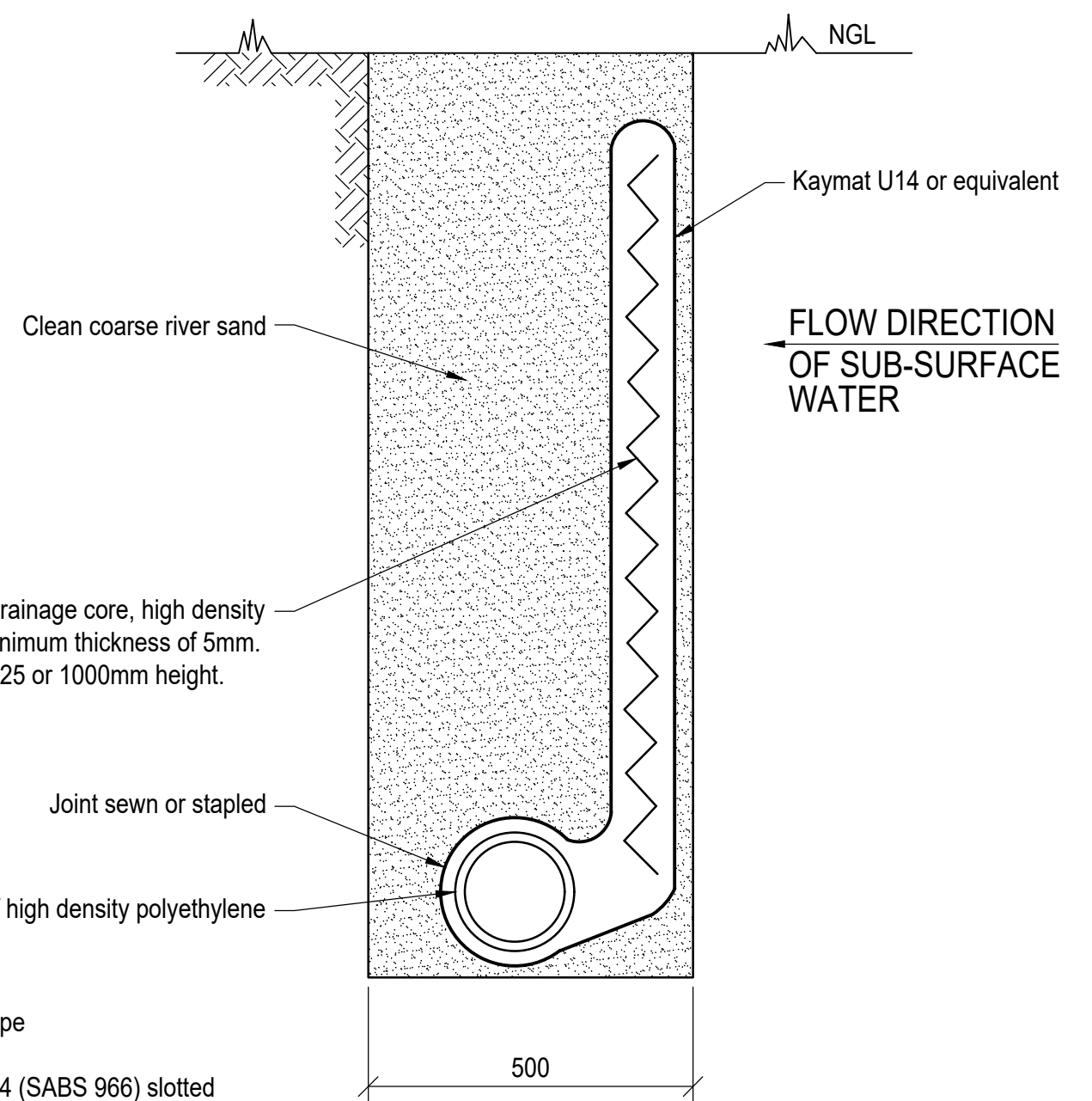


DETAIL B
(NB: ALTERNATIVE METHOD)



AGGREGATE DRAIN

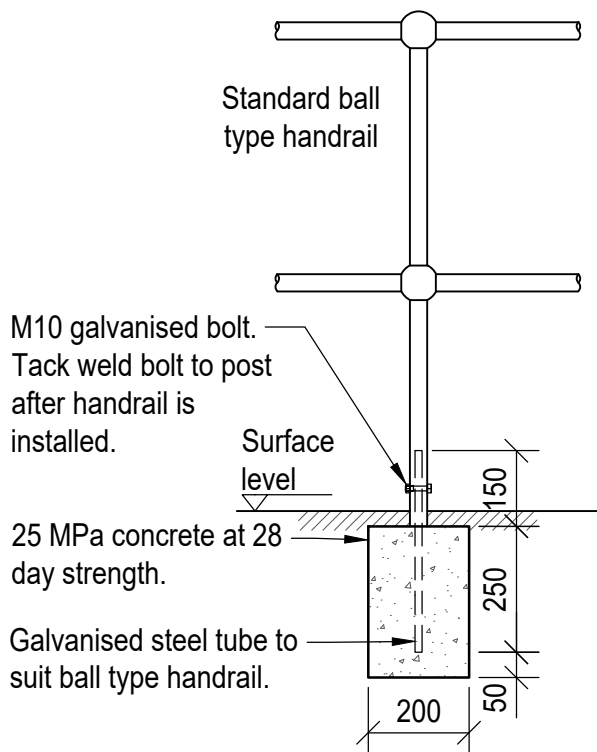
50, 65, 80, 100 OR 150mm dia. - Geopipe
or
110 OR 160mm dia. uPVC pipes Class 4 (SABS 966) slotted
or
Vitrified clay pipes Class II (SABS 559) with Vitro subsoil
drainage couplings with tapered drive joints
or
uPVC cordrain (DIN 1187) 65, 90, 110 or 160mm dia.



COMPOSITE DRAIN

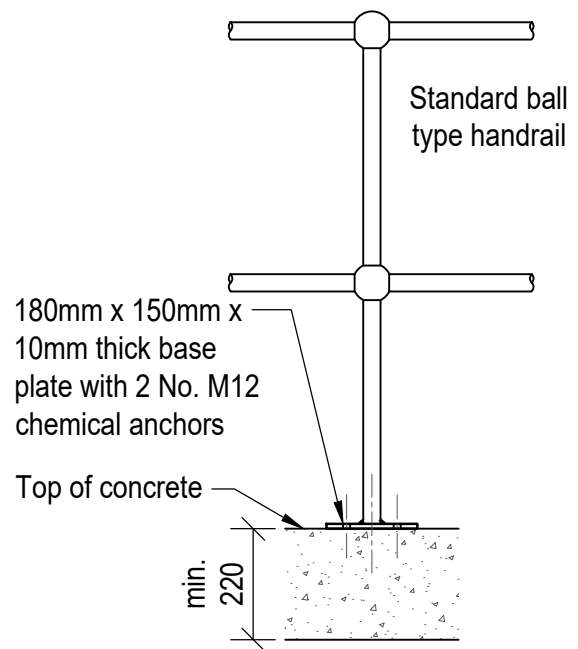
NOTES :

1. Holes or slots to be located towards 4 & 8 o'clock.
2. Engineer to advise on levels and position on site.



HANDRAIL FIXING DETAIL ON CONCRETE BASE

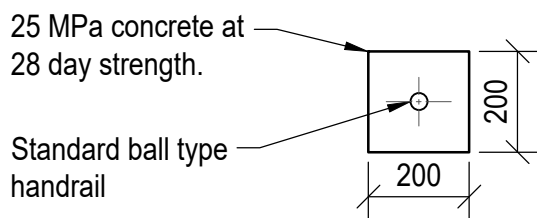
SCALE 1:15



HANDRAIL FIXING DETAIL ON BASE PLATE

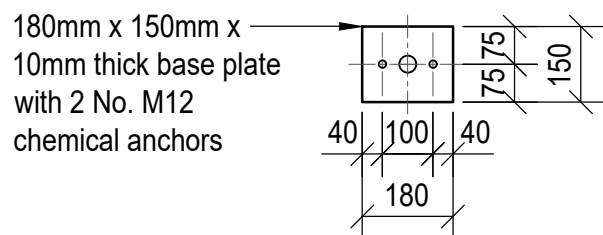
SCALE 1:15

M12 CHEMICAL ANCHOR SPECIFICATION :
Fischer M12 (8.8) galvanised H.D. Anchor Studs with embedment length = 200mm) with Fischer IS-V-360 Chemical Mortar or equally approved hemical Anchors with 'ETA' (European Technical Approval).



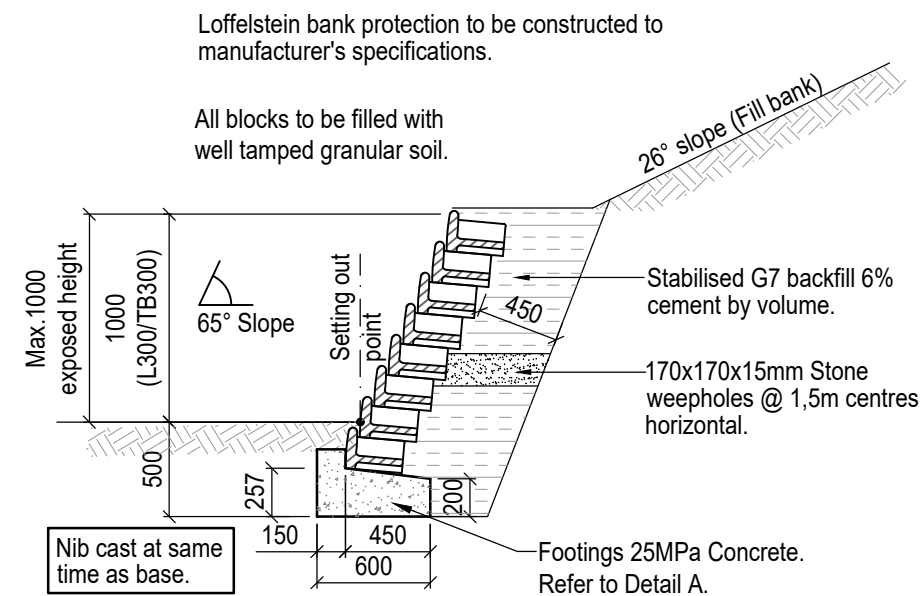
PLAN ON CONCRETE BASE

SCALE 1:15

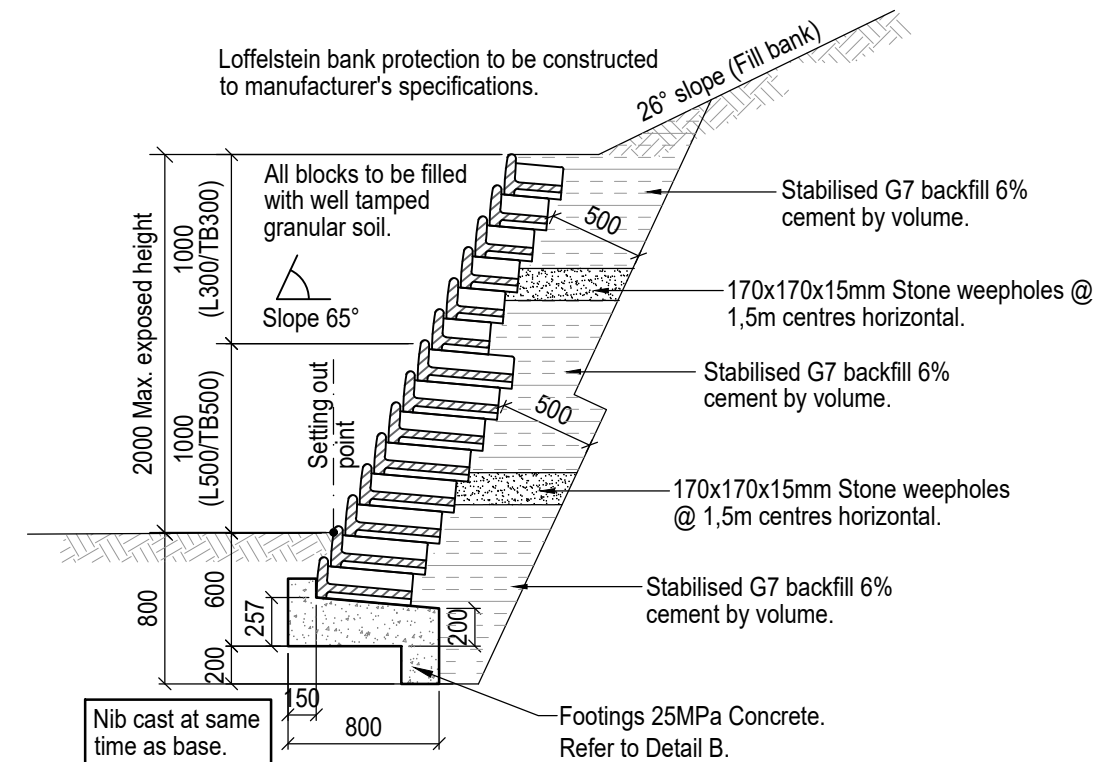


PLAN ON STEEL BASE PLATE

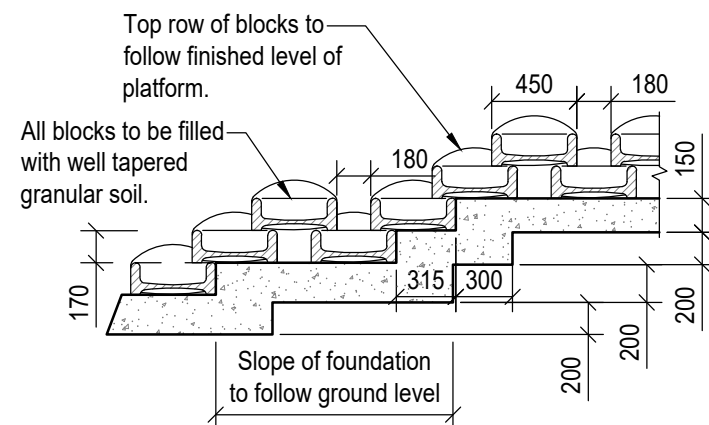
SCALE 1:15



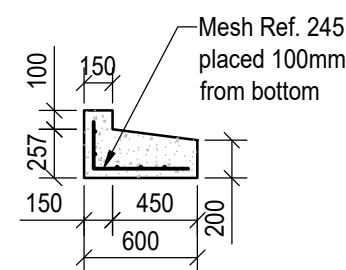
TYPICAL SECTION SHOWING LOFFELSTEIN
RETAINING WALL
(0m TO 1m EXPOSED HEIGHT)
N.T.S



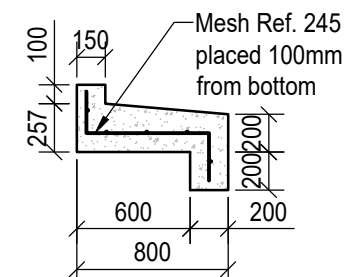
TYPICAL SECTION SHOWING LOFFELSTEIN
RETAINING WALL
(1m TO 2m EXPOSED HEIGHT)
N.T.S



TYPICAL STEPPED FOUNDATION DETAIL
N.T.S



DETAIL A



DETAIL B

NOTES:

1. Prove all services prior to construction.
2. Retaining block sample to be approved by Engineer prior to procurement. Only approved retaining blocks are to be used in construction.
3. Position and extent of retaining wall to be confirmed on site by Engineer.
4. Insitu subbase soil material to be compacted to min. 90% MOD AASHTO. Compaction test results to be submitted to the Engineer for approval prior to casting of concrete.
5. Reinforcement to be inspected by Engineer prior to casting concrete.
6. 7 day and 28 day concrete cube test results to be submitted to Engineer for review and approval.

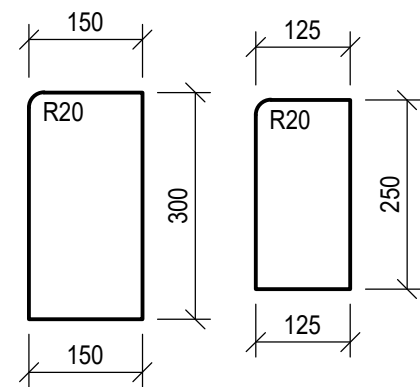


FIG. 1

FIG. 2

RECTANGULAR
KERBS

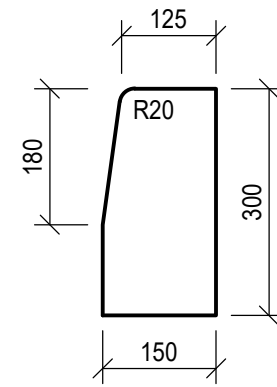


FIG. 3

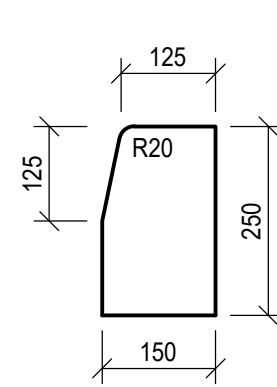


FIG. 4

HALF BATTERED
KERBS

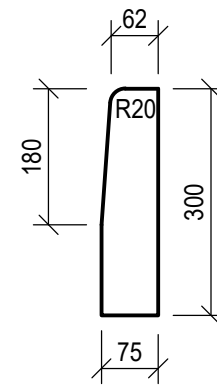


FIG. 5

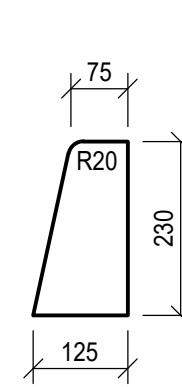


FIG. 6

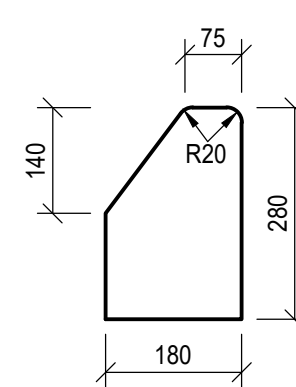


FIG. 7

BATTERED
KERBS

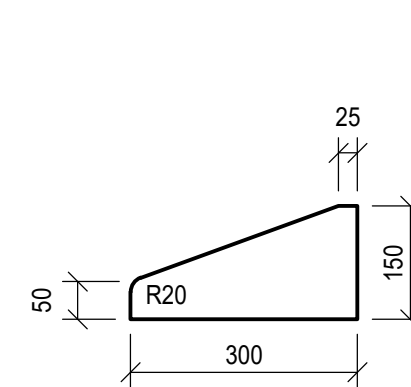


FIG. 8

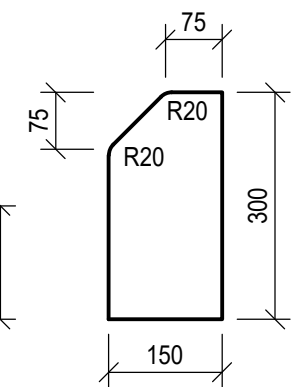


FIG. 9

MOUNTABLE
KERBS

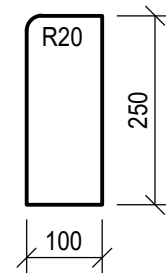


FIG. 12

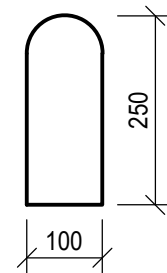


FIG. 11

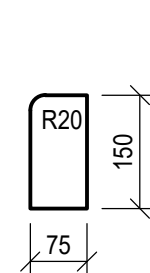


FIG. 12

RECTANGULAR
HALF ROUND
RECTANGULAR
EDGINGS

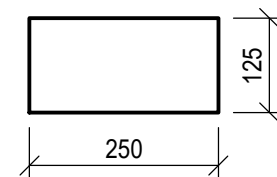


FIG. 13

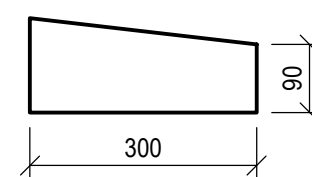
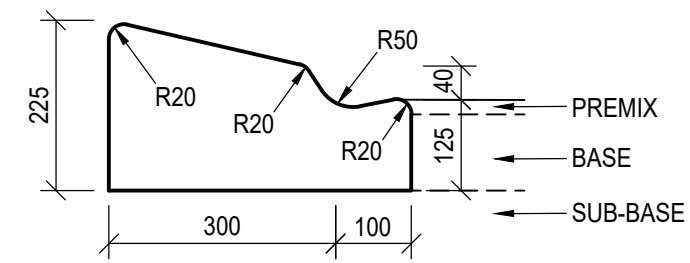


FIG. 14

RECTANGULAR
CHANNELS
TAPERED



IN-SITU MOUNTABLE
KERBS WITH GULLY

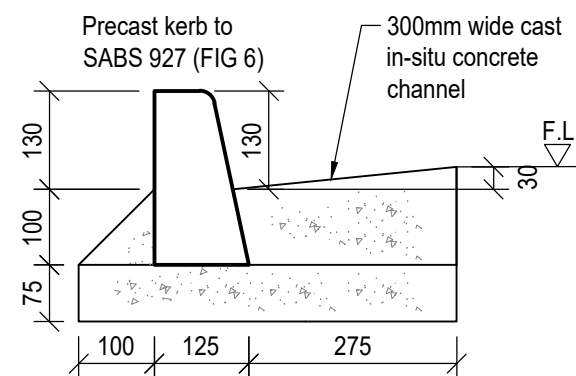


FIG 6 KERB DETAIL - WITH
CHANNEL

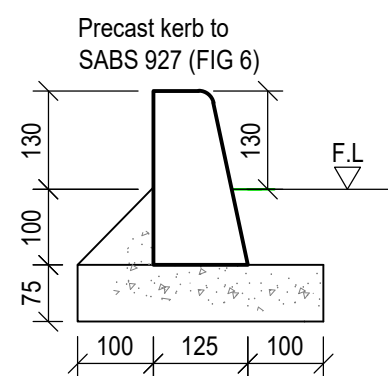


FIG 6 KERB DETAIL -
NO CHANNEL

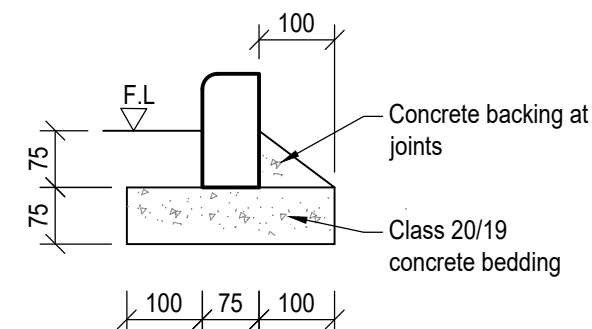


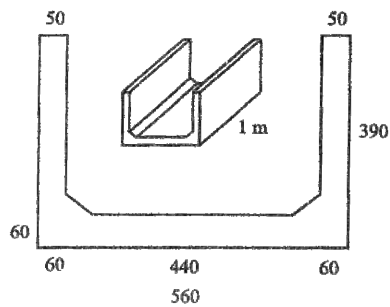
FIG 12 KERB DETAILS

NOTE

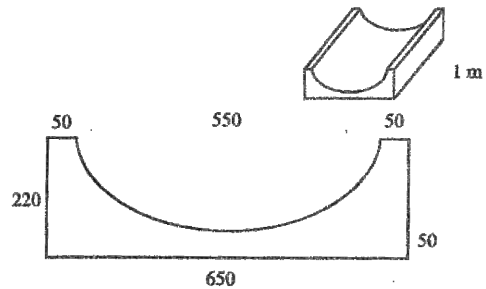
1. Expansion joints of 12mm width AT 20m intervals as per Clause 5.7 of SABS 1200 M/C.
2. Mass concrete backing at all joints.

SURFACE WATER CHANNELS

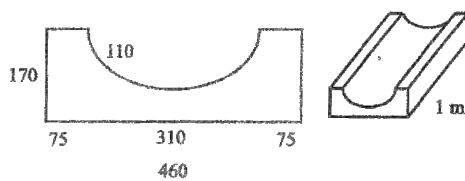
SWC 1



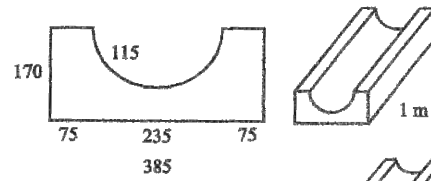
SWC 2



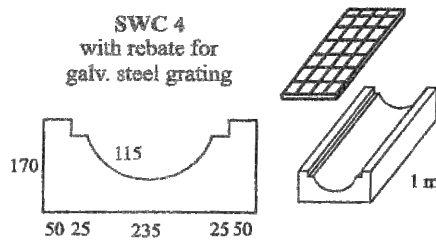
SWC 3



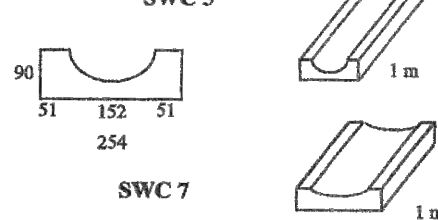
SWC 4



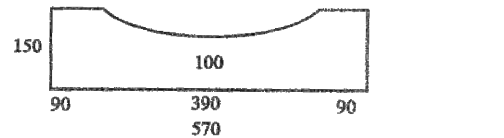
SWC 4
with rebate for
galv. steel grating



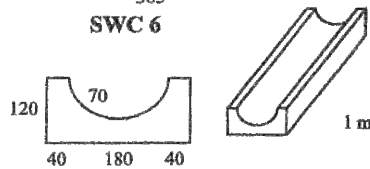
SWC 5



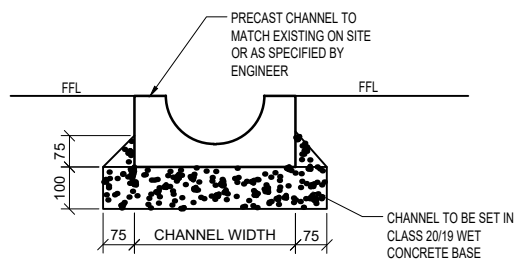
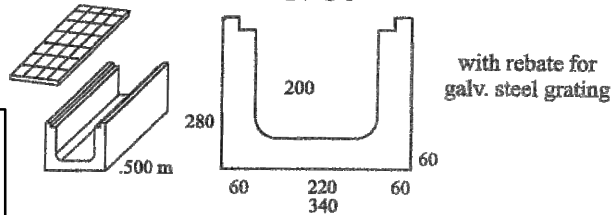
SWC 7



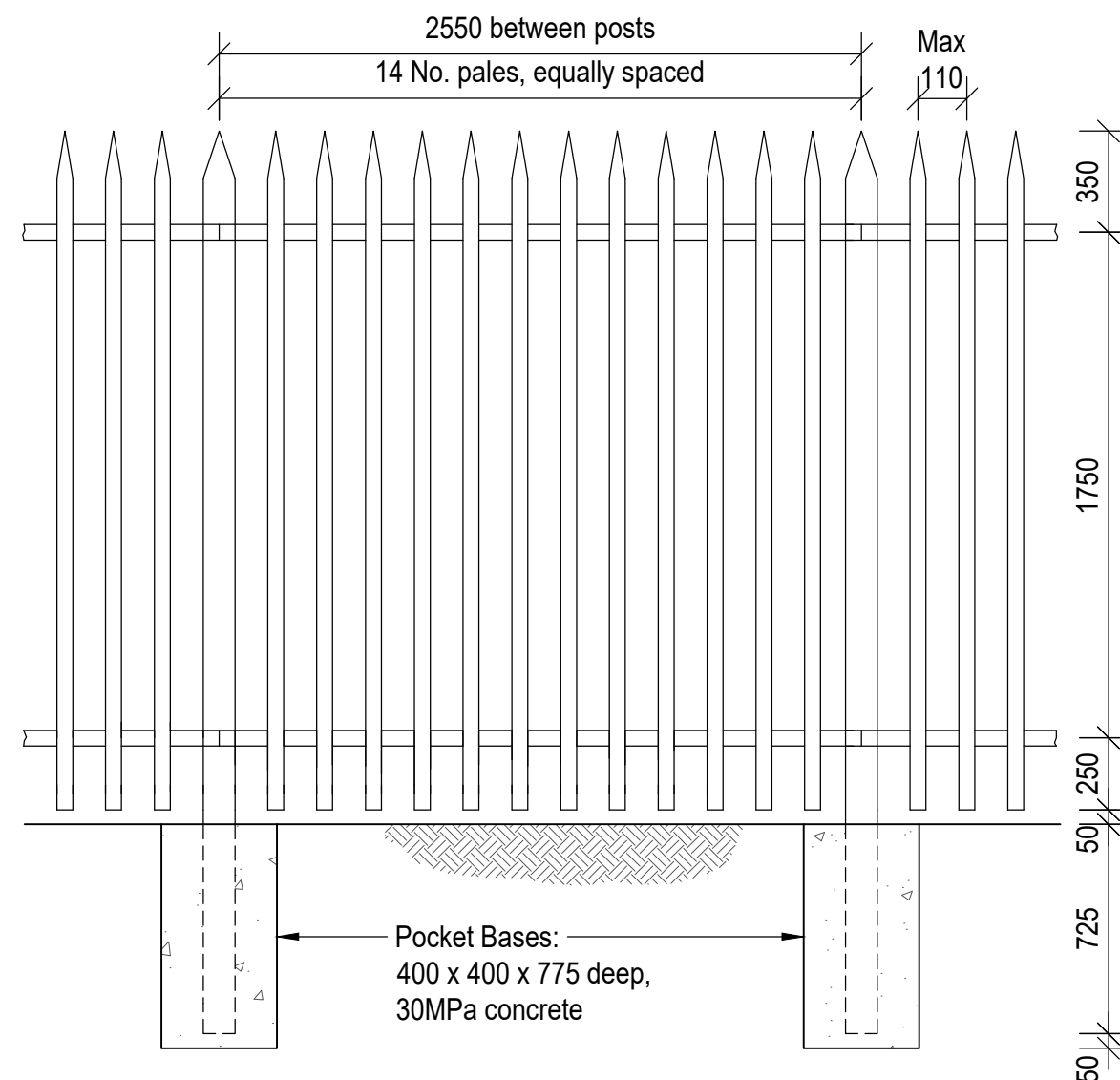
SWC 6



SWC 8



**TYPICAL INSTALLATION DETAILS FOR PRECAST
CONCRETE SURFACE WATER CHANNELS**
N.T.S



STEEL PALISADE FENCE – SPECIFICATION NO. 278/SPF SPECIFICATION FOR THE FABRICATION AND INSTALLATION OF STEEL PALISADE FENCING

1. DIMENSIONS AND GENERAL CHARACTERISTICS

- 1.1 Main posts:
Shaped IPE 100 sections. 100 x 55 x 8.1 kg/m. Grade 300 W, hot-rolled sections slotted to receive fish plates top and bottom.
- 1.2 Rails:
Top and bottom rail : 60 x 60 x 5 angles. Grade 300W, hot-rolled sections.
- 1.3 Pales:
40 x 40 x 5 angles. Grade 300W, hot rolled sections.
- 1.4 Fish plates:
140 x 50 x 8 mm flat bar.
- 1.5 Fixings:
Pales to rail - Welding to SABS standards rails to fish plate: M12
'Ant-vandal' shear fixings, top and bottom grade 8.8.

2. CONSTRUCTION

- 2.1 Posts shall be provided at 2.55m center to center, shaped to a point at the top. Post to be embedded in 30 MPa concrete pocket base (min. 400 x 400 x 800 deep) to a minimum depth of 725mm.
- 2.2 Posts to rails connections:
Rails shall be secured to posts with connector plates or 'fish plates', bolted to the vertical leg of the rail.
- 2.3 Protective treatment:
After the fabrication of fencing components, including the punching or drilling of any holes, the fencing shall be hot-dipped galvanized to SANS 763 standards.
- 2.4 General:
All founding conditions to be inspected by the engineer prior to concrete being cast. MAP AFRICA CONSULTING ENGINEERS to approve all shop drawings prior to fabrication of the steel palisade fence.

NOTES

1. Posts : IPE 100 x 55 (8.1 kg/m), rails: 60 x 60 x 5 angles and pales: 40 x 40 x 5mm.
2. Pales to be welded to rails and all welds to be 5mm CFW.
3. All steelwork to be hot-dipped galvanised to SANS 763 standards.
4. Location and extent of fence to be confirmed on site prior to fabrication.
5. Engineer to inspect founding conditions prior to concrete being cast.

TYPICAL SECTION ON STEEL PALISADE FENCE

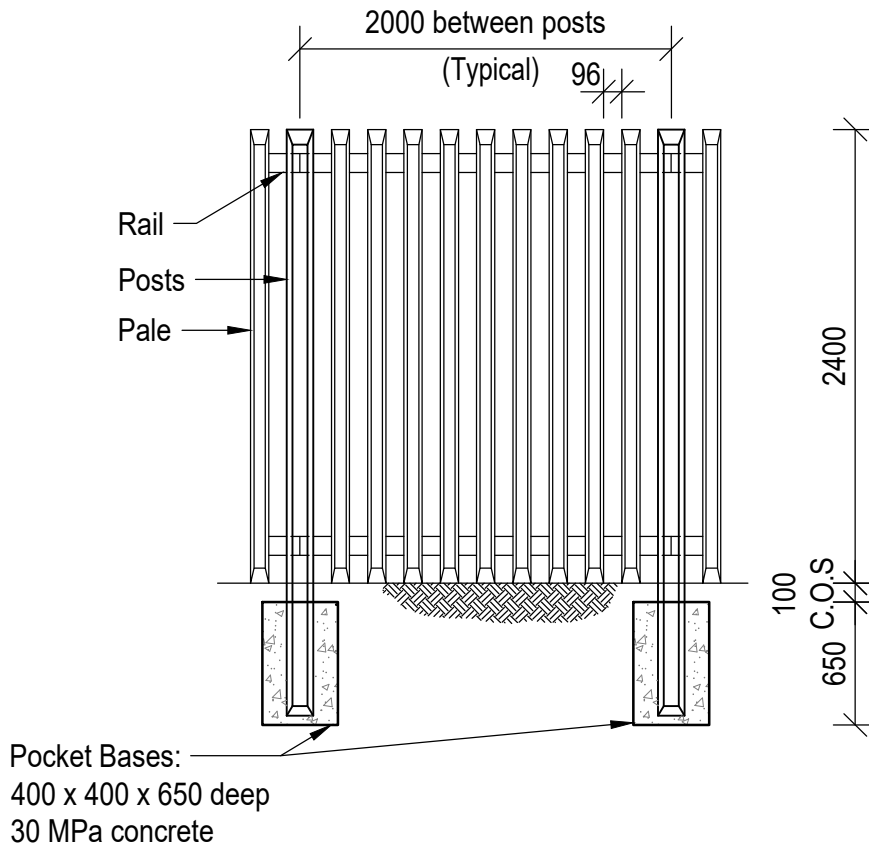


DETAILS:
TYPICAL GALVANISED
STEEL PALISADE FENCING
DETAILS

SKETCH No.
Sk 908

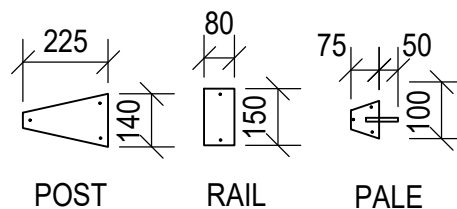
NOTES

1. Location of fence to be confirmed on site prior to fabrication and/ or construction.
2. Engineer to inspect founding conditions prior to concrete.



TYPICAL ELEVATION ON CONCRETE PALISADE FENCE

SCALE 1 : 40

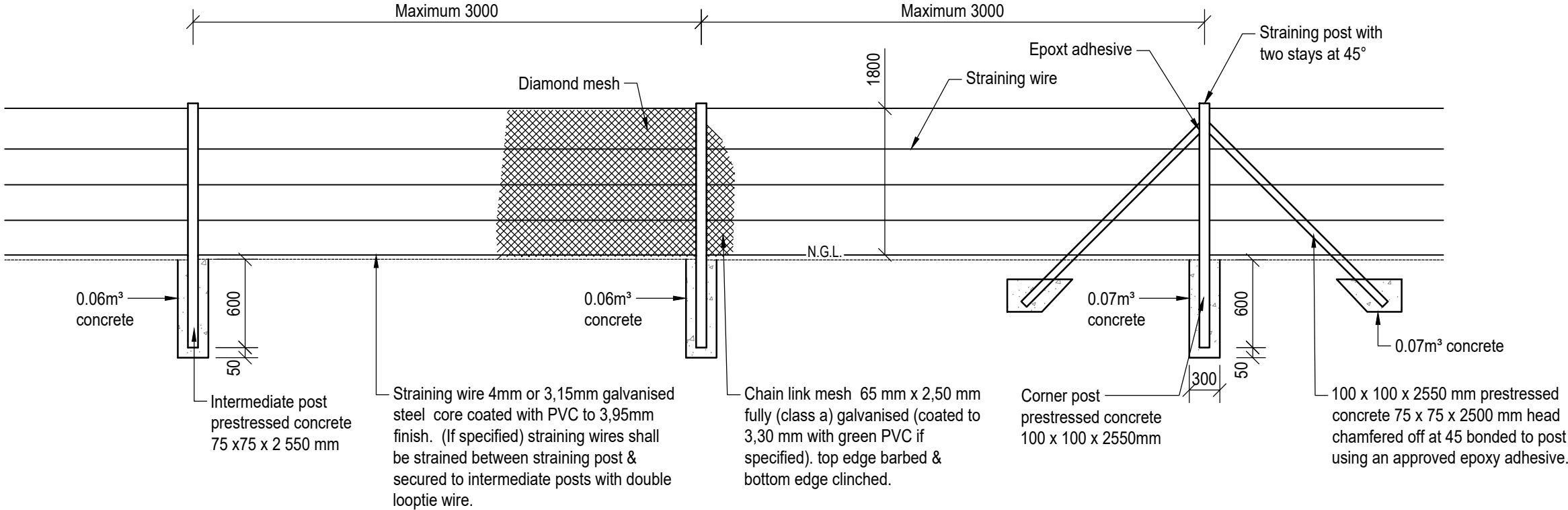


SECTIONAL DETAILS

SCALE 1 : 40

NOTES:

1. All posts, droppers and standards to be on the inside of fence.
2. Straining posts to be used at every change of vertical and horizontal direction with a maximum spacing of 30 metres.
3. Intermediate posts to be used at a maximum spacing of 3 meters.
4. Concertina gates to be used where specified.
5. Specification for corrosion protection for gate to be specified when ordering.
6. Specification for gate hinges to be specified when ordering.
(e.g. hole type or bracket type).



CONCRETE FENCE SUPPORTS WITH CHAIN LINK MESH

N.T.S



DETAILS:

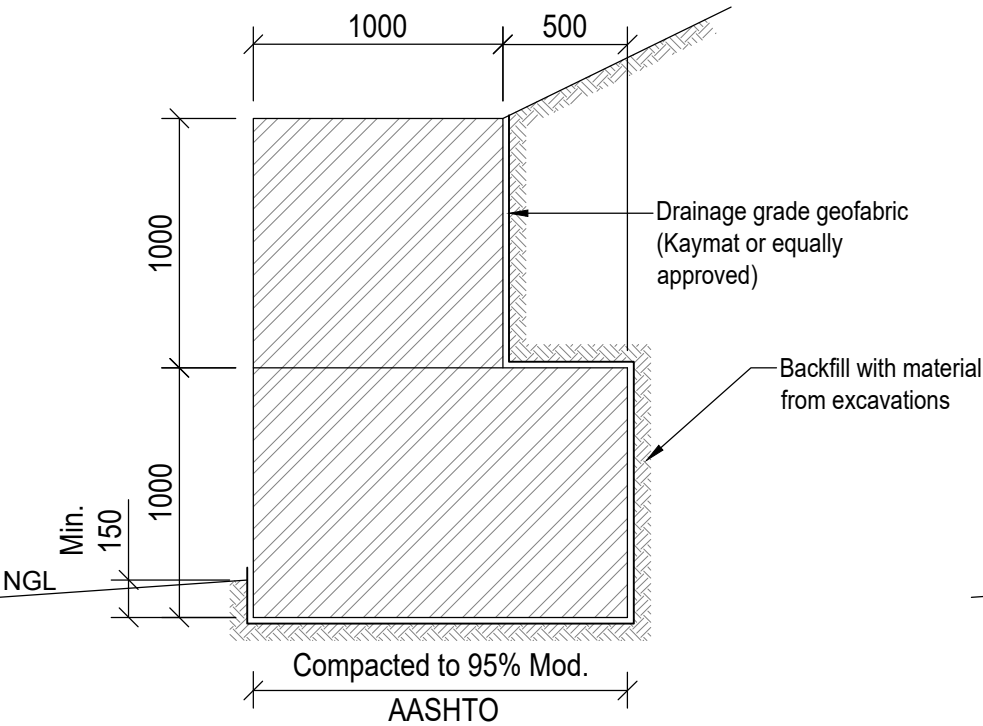
TYPICAL WIRE MESH
FENCING DETAILS

SKETCH No.

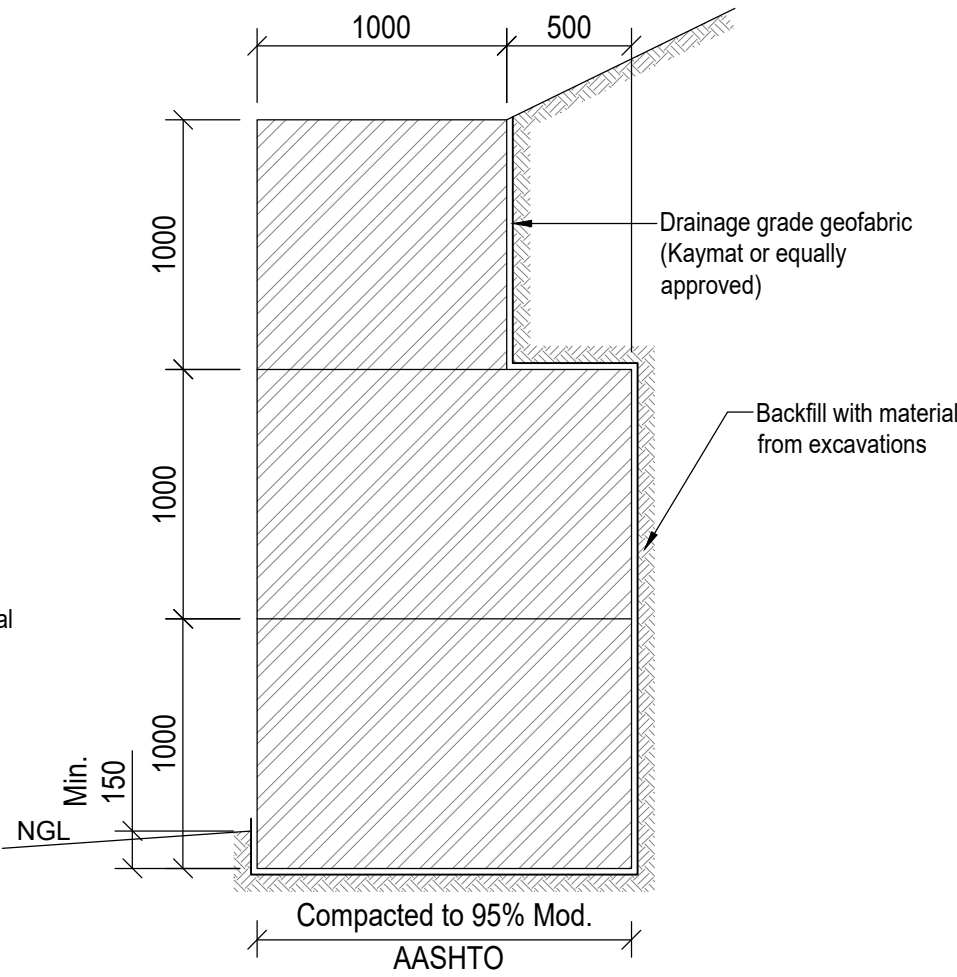
Sk 910

NOTES:

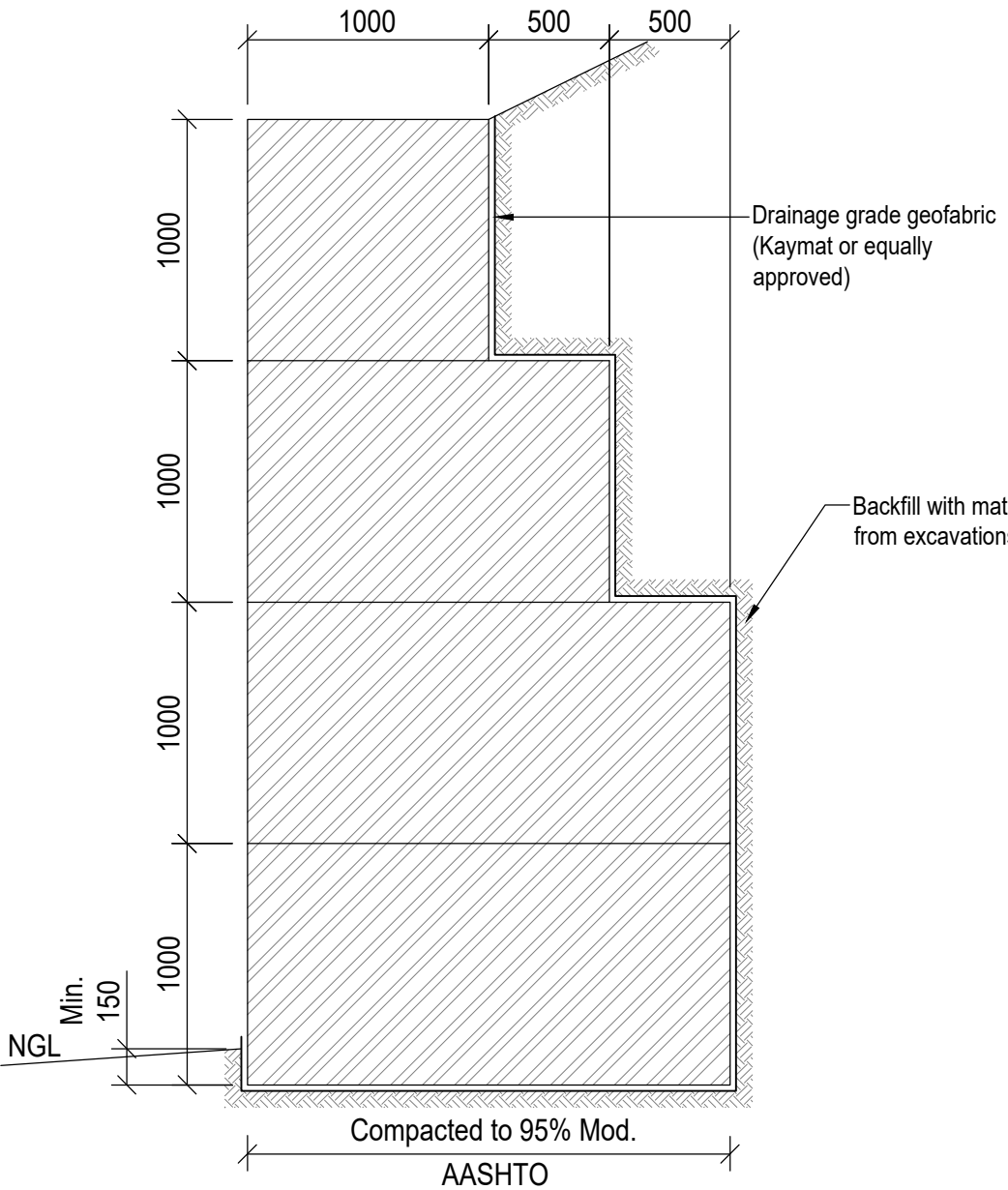
- 1. Foundations to be stepped and prepared as instructed by the Engineer.
- 2. Geotextile fabric to be Grade C or similar as instructed by the Engineer.
- 3. All wire used in the making of gabions shall be galvanised in accordance with the provisions S.A.B.S. 1580:1993 for Class A heavy galvanised mild-steel wire.
- 4. The standard sizes of gabions are as follows :
Length : 1,0m , 2,0m , 3,0m & 4,0m
Width : 1,0m 1,5m.
Depth : 0,5m & 1,0m
Diaphragm spacing : 1,0m
- 5. Lacing and bracing to be done in accordance with Manufactures recommendations.



TYPICAL 2,0m
HIGH WALL



TYPICAL 3,0m
HIGH WALL



TYPICAL 4,0m
HIGH WALL

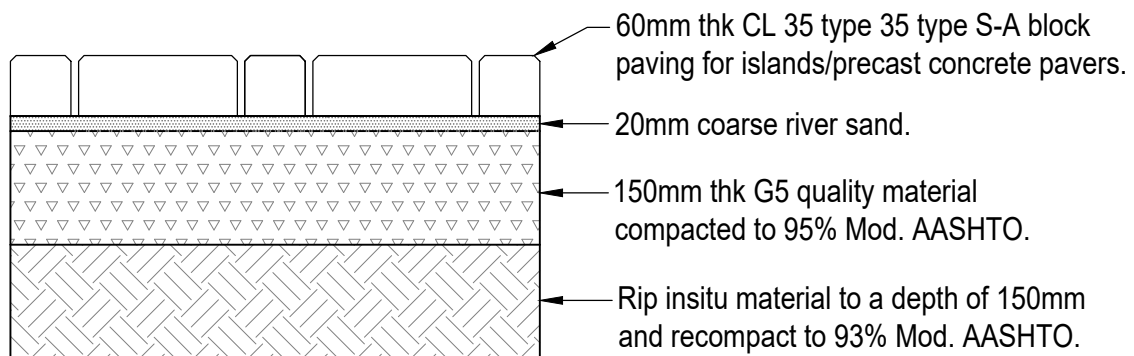
TYPICAL DETAILS OF GABION RETAINING WALLS OF VARIOUS HEIGHTS

N.T.S



DETAILS:
TYPICAL GABION
RETAINING WALL DETAILS

SKETCH No.
Sk 911



TYPICAL BRICK PAVING/ PRECAST CONCRETE PAVING LAYERWORKS DETAILS

N.T.S

PROPERTY	G1	G2	G3	G4	G5	G6	G7
Max. Diameter (mm)	37.5	37.5	37.5	53.0	63.0	63.0	100.0
Grading Modulus	Grading Envelope	Grading Envelope	Grading Envelope	Grading Envelope	>= 1.50	>= 1.20	>= 0.75
Liquid Limit (max) %	25	25	25	25	30	-	-
Plasticity Index (max) %	4	6	6	6	10	12	12
10% Fact (min) (kN)	110	110	N.A.	N.A.	N.A.	N.A.	N.A.
Linear Shrinkage (%) (max)	2	3	3	3	5	6	6
ACV (max) (%)	29	29	N.A.	N.A.	N.A.	N.A.	N.A.
Flakiness Index (%)	>= 35.0	>= 35.0	N.A.	N.A.	N.A.	N.A.	N.A.
Min. CBR %	N.A.	80 @ 98% Mod. AASHTO	80 @ 98% Mod. AASHTO	80 @ 98% Mod. AASHTO	45 @ 95% Mod. AASHTO	25 @ 93% Mod. AASHTO	15 @ 93% Mod. AASHTO
Swell (max) % at 100% Mod.	N.A.	0.2	0.2	0.2	0.5	1.0	1.5
Soluble Salts (%)	<0.2%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MgS ₄ O + Na S ₂ O ₄ (%)	<0.05%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

MATERIAL PROPERTIES FOR:

Crushed stone (G1, G2, G3)
Natural Gravel (G4, G5, G6)
Gravel Soil (G7)

PROPERTY	G8	G9	G10	SELECTED FILL
Grading Modulus	No Requirements	No Requirements	No Requirements	No Requirements
Min CBR% at in-situ density	10	7	3	10
Swell (max) % at 100% Mod AASHTO	1.5	1.5	1.5	1.5
Liquid Limit (max) (%)	N.A.	N.A.	N.A.	40
Plasticity Index (max) (%)	N.A.	N.A.	N.A.	18

MATERIAL PROPERTIES FOR GRAVEL - SOIL AND SELECTED FILL

PROPERTY	C1	C2	C3	C4
Max. Diameter (mm)	37.5	37.5	63.0	63.0
Grading Modulus Before Treatment	>=1.50	>=1.50	>=1.50	>=1.50
Liquid Limit (max) Before %	25	25	30	45
Plasticity Index (max) Before (%)	6	6	10	10
Plasticity Index (max) After (%)	N.A.	N.A.	6	6
10% Fact (min) (kN)	110	110	N.A.	N.A.
ACV (max) (%)	29.0	29.0	N.A.	N.A.
Flakiness Index (%)	<=35.0	<=35.0	N.A.	N.A.
Sand Added Equivalent (%)	>=30.0	>=30.0	N.A.	N.A.
UCS 100% Mod. AASHTO (MPa)	>6.0 <12.0	>3.0 <6.0	>1.5 <3.0	>0.75 <1.5

MATERIAL PROPERTIES FOR CEMENTED CRUSHED STONE OR NATURAL GRAVEL

SIEVE SIZE	%PASSING		
	G1,C1,C2	G2,G3,C1,C2	G4
53.00mm	100	100	100
37.5mm	100	100	85-100
26.5mm	84-94	100	-
19.0mm	71-84	85-95	60-90
13.2mm	59-75	85-95	-
4.75mm	36-53	42-60	30-65
2.00mm	23-40	27-45	20-50
0.425mm	11-24	13-27	10-30
0.075mm	4-12	5-12	5-15

GRADING ENVELOPE

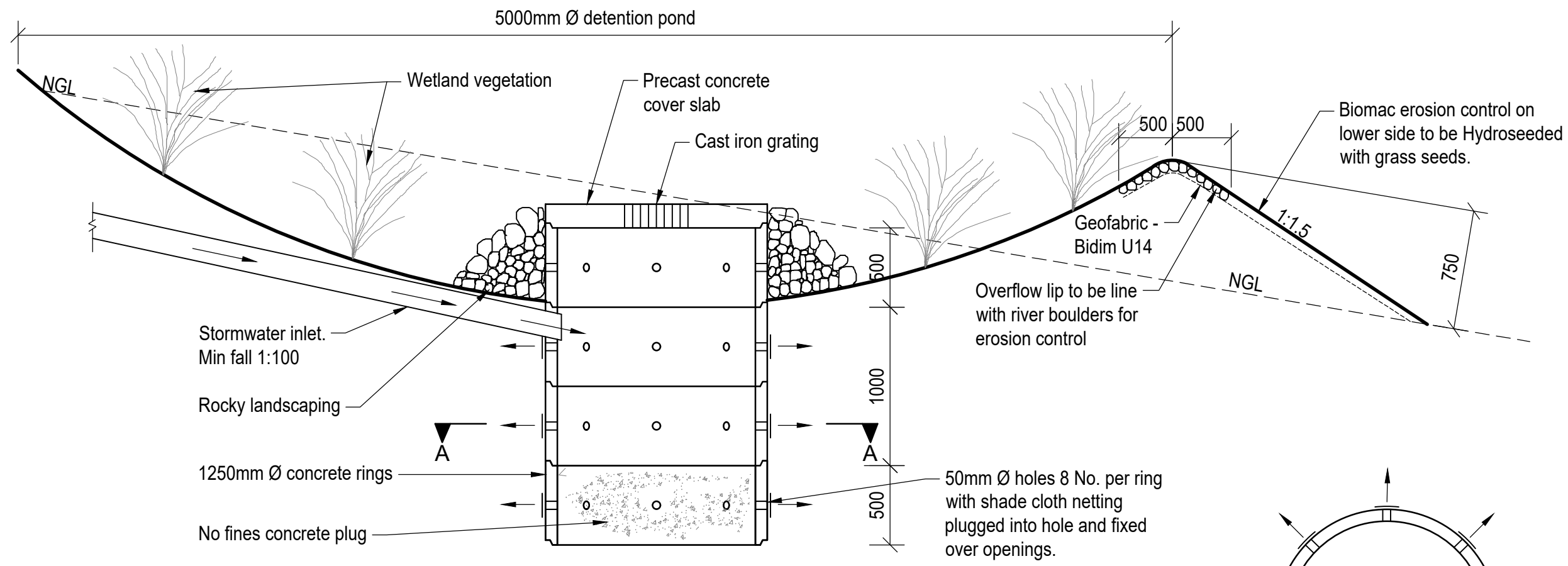
NOTES

1. Type and percentage of stabilization to be determined by laboratory.
2. Material properties derived from TRH 14 & SABS 1200



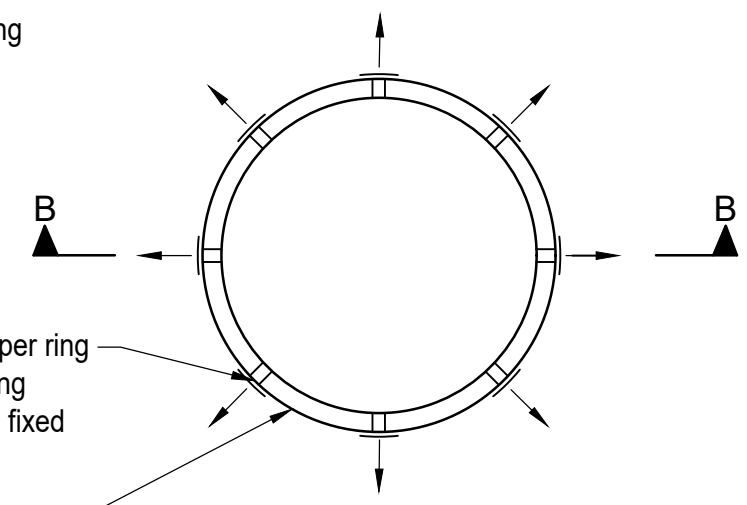
DETAILS:
MATERIAL PROPERTIES
FOR LAYERWORKS

SKETCH No.
Sk 913



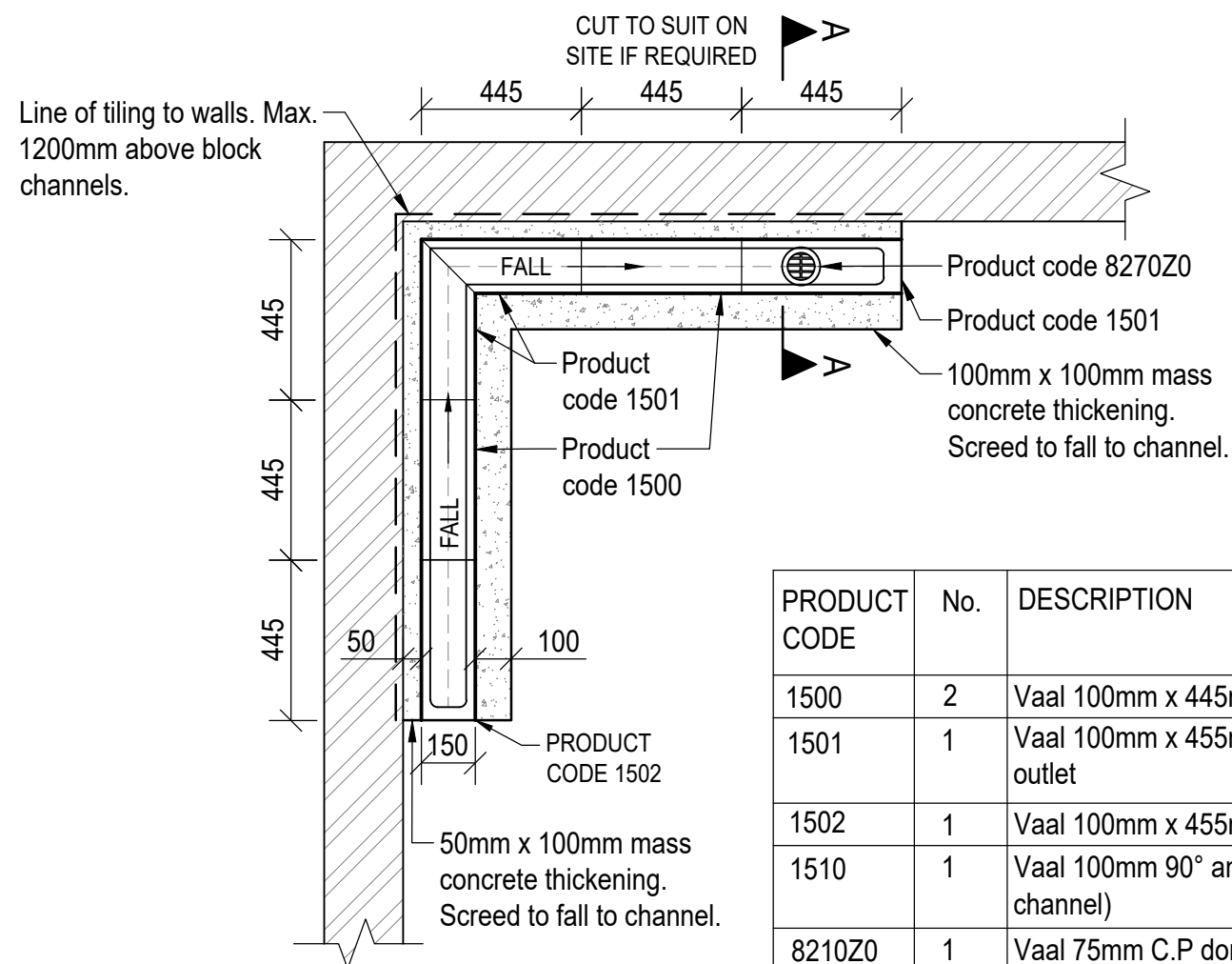
SECTION B-B
N.T.S

NOTE:
PIPE DIAMETER AND POSITION
OF POND TO BE DETERMINED
ON SITE BY ENGINEER



SECTION A-A
N.T.S

TYPICAL DETAILS FOR SOAK AWAY

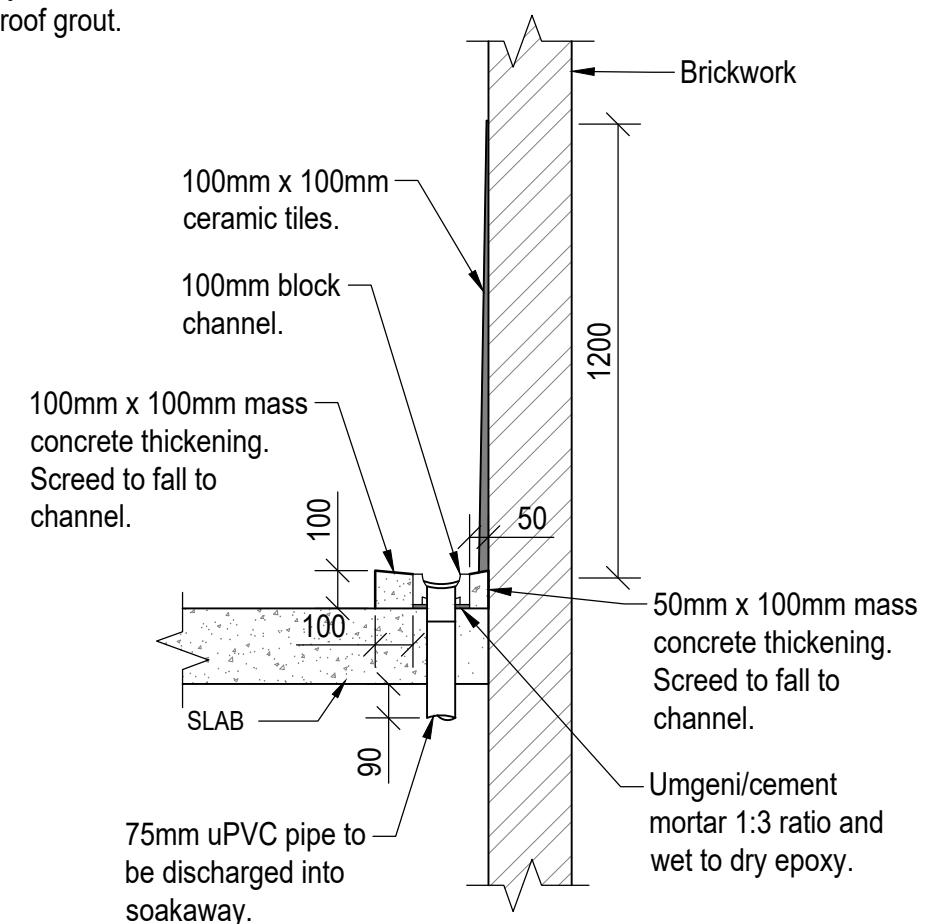


PLAN
SCALE 1:20

PRODUCT CODE	No.	DESCRIPTION
1500	2	Vaal 100mm x 445mm plain
1501	1	Vaal 100mm x 455mm with 75mm centre outlet
1502	1	Vaal 100mm x 455mm stopend
1510	1	Vaal 100mm 90° angle (two mitred 150 channel)
8210Z0	1	Vaal 75mm C.P dome grating

NOTE:

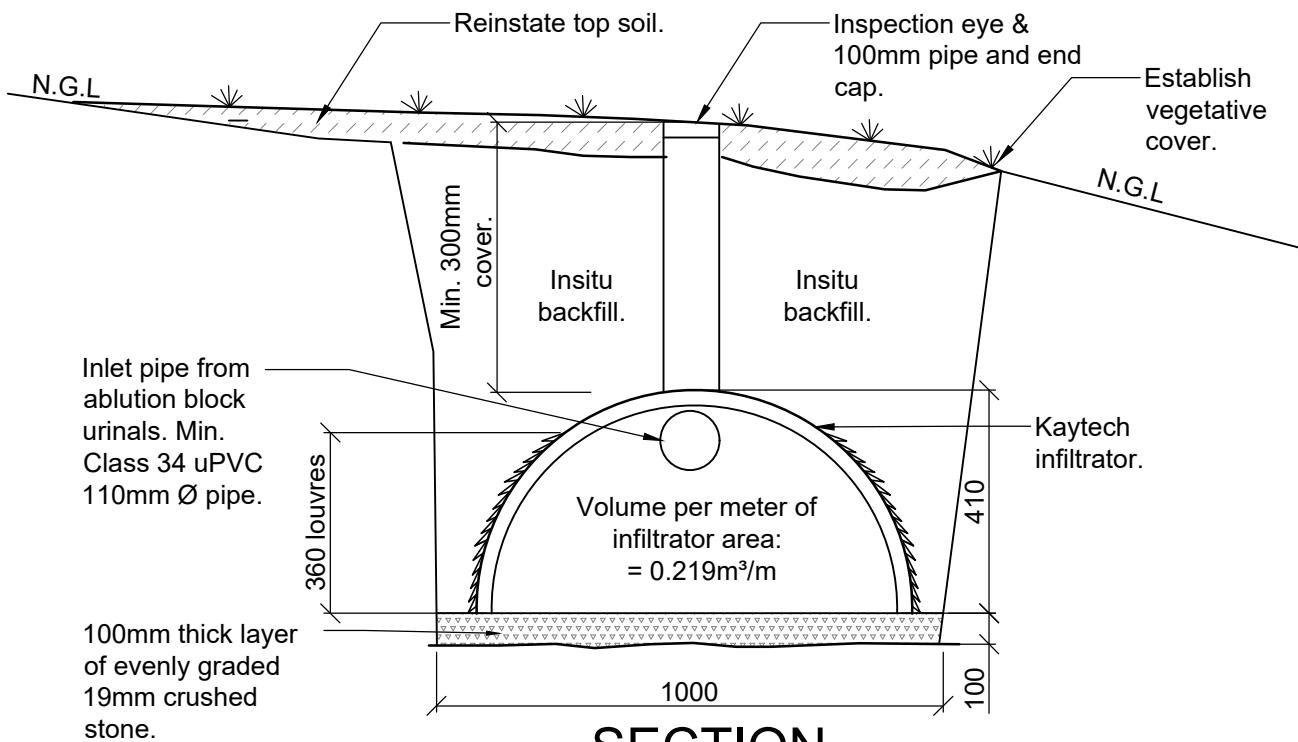
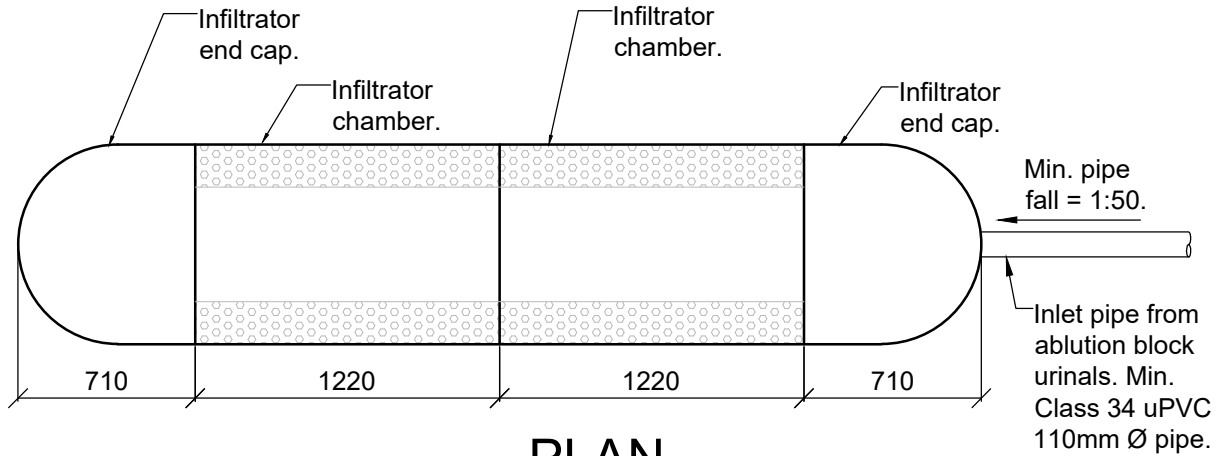
The channels are to be fixed to the surface bed with umgeni/cement mortar 1:3 ratio and wet to dry epoxy. The surface bed is to be scabbled prior to application of mortar. The channel is to be laid as per plan fall. All joints between channels to be sealed with waterproof grout.



SECTION A-A
SCALE 1:20

FOR CONSTRUCTION

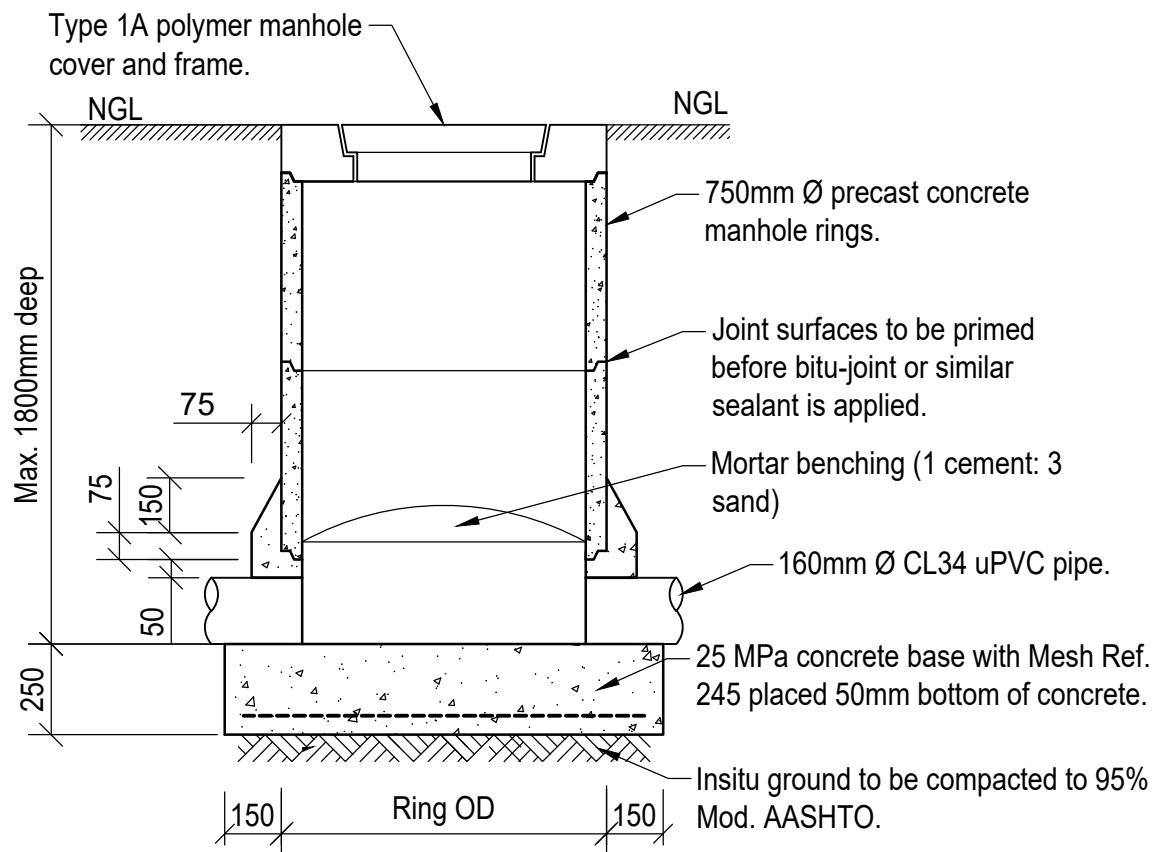
NOTE: Position of
soakaways and routing of
pipes to be confirmed on
site by the Civil Engineer.



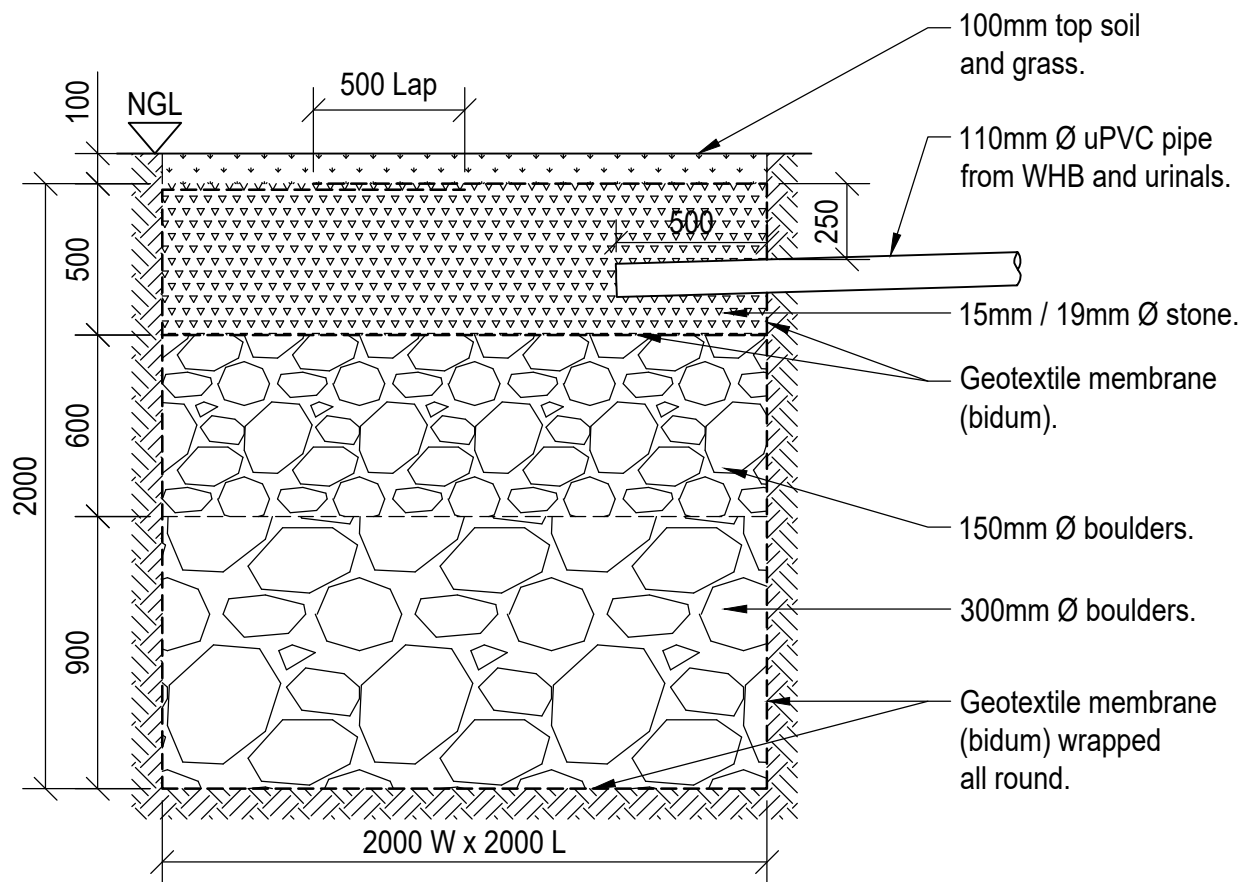
TYPICAL SECTION THROUGH INFILTRATOR SOAKAWAY

NOTES:

1. All precast concrete manhole components to comply with the requirements of S.A.B.S.1294 (where applicable).
2. Rendering for manhole benching shall consist of 1 part cement to 2 parts sand thoroughly mixed and applied to concrete surfaces while the latter is still green. Rendering shall be at least 20mm thick.
3. Spacings between manholes should not exceed 25m.
4. Pipe size to be confirmed by Engineer on site.



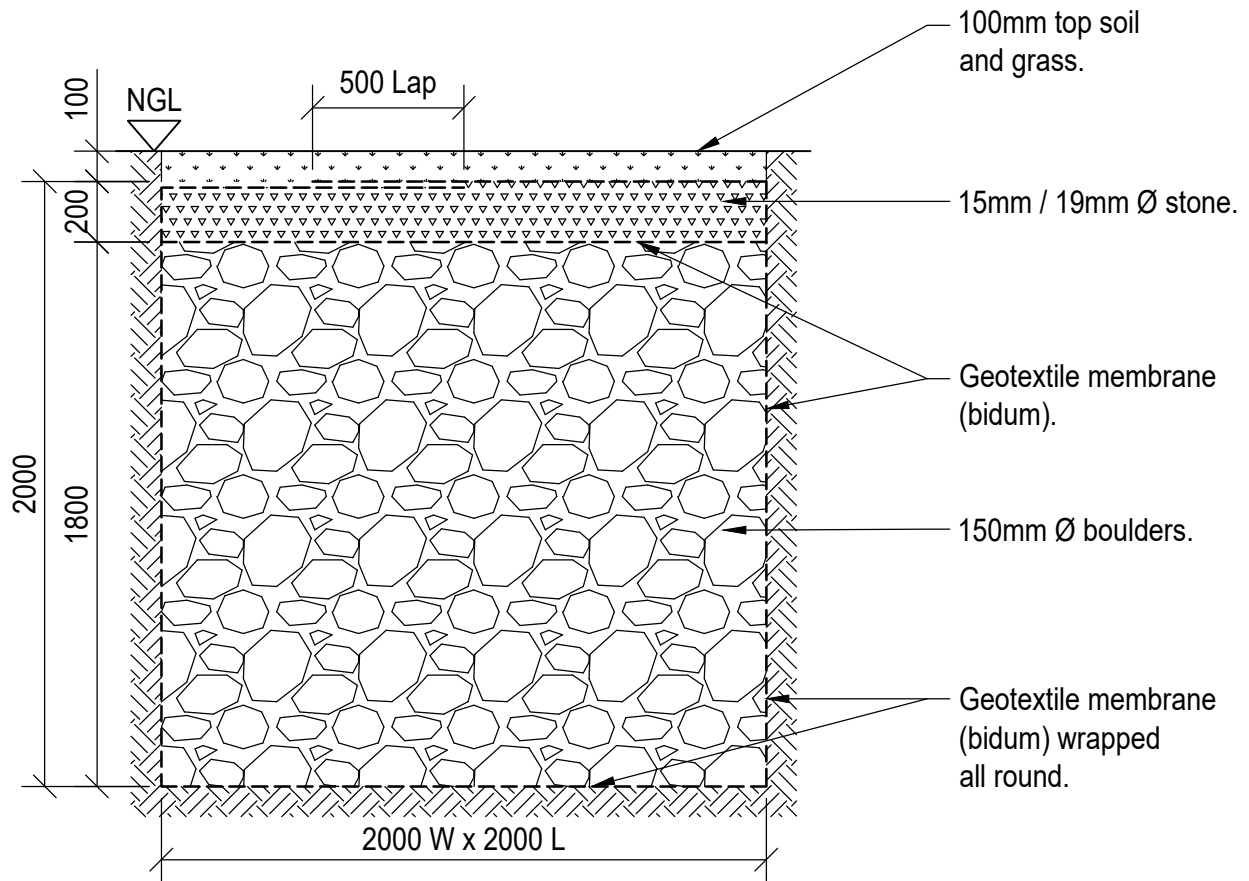
SECTION SEWER MANHOLE 750mm Ø RING MANHOLE DETAIL (0,0m TO 1,5m DEEP) N.T.S



SECTION

TYPICAL SOAKAWAY DETAIL FOR URINAL AND W.H.B DISCHARGE

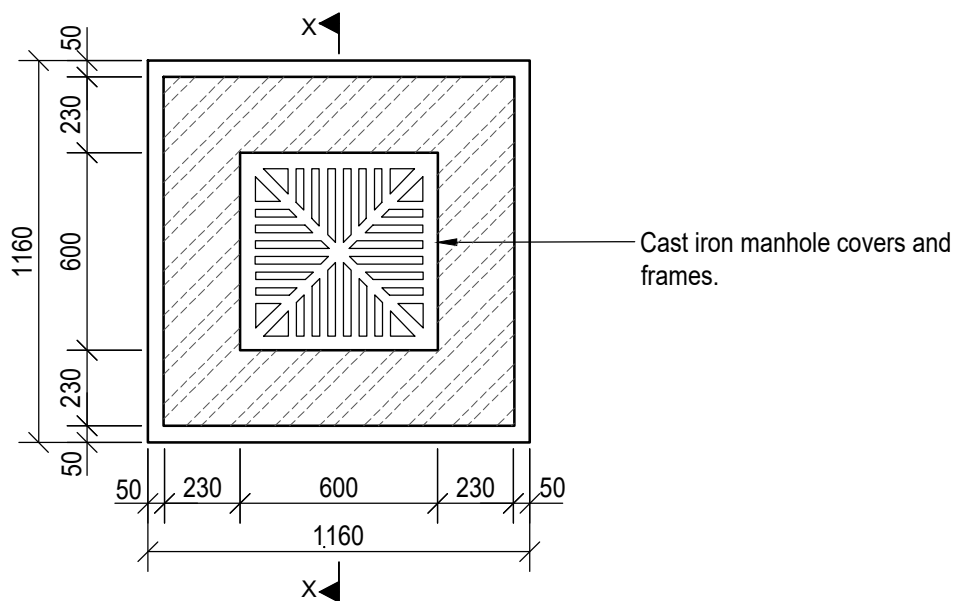
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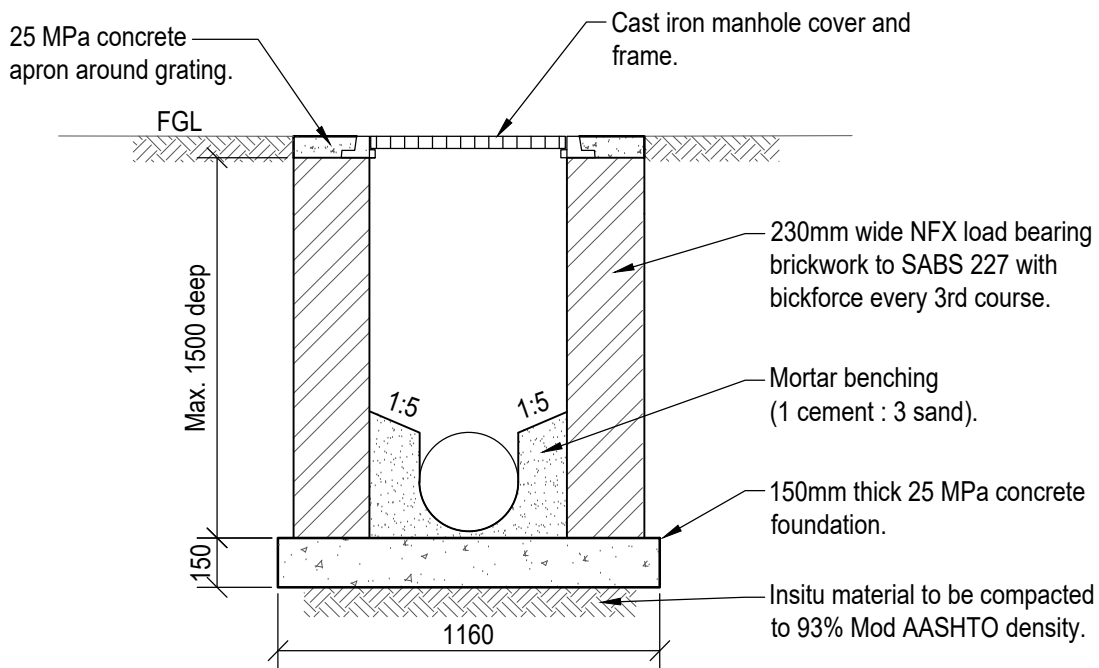
SECTION

TYPICAL STORMWATER SOAKAWAY DETAIL

N.T.S



PLAN



SECTION X-X

TYPICAL STORMWATER MANHOLE 600 X 600 STORMWATER MANHOLE DETAILS (MAX. 1500mm DEEP)

N.T.S